

Service Service Service



Service Manual

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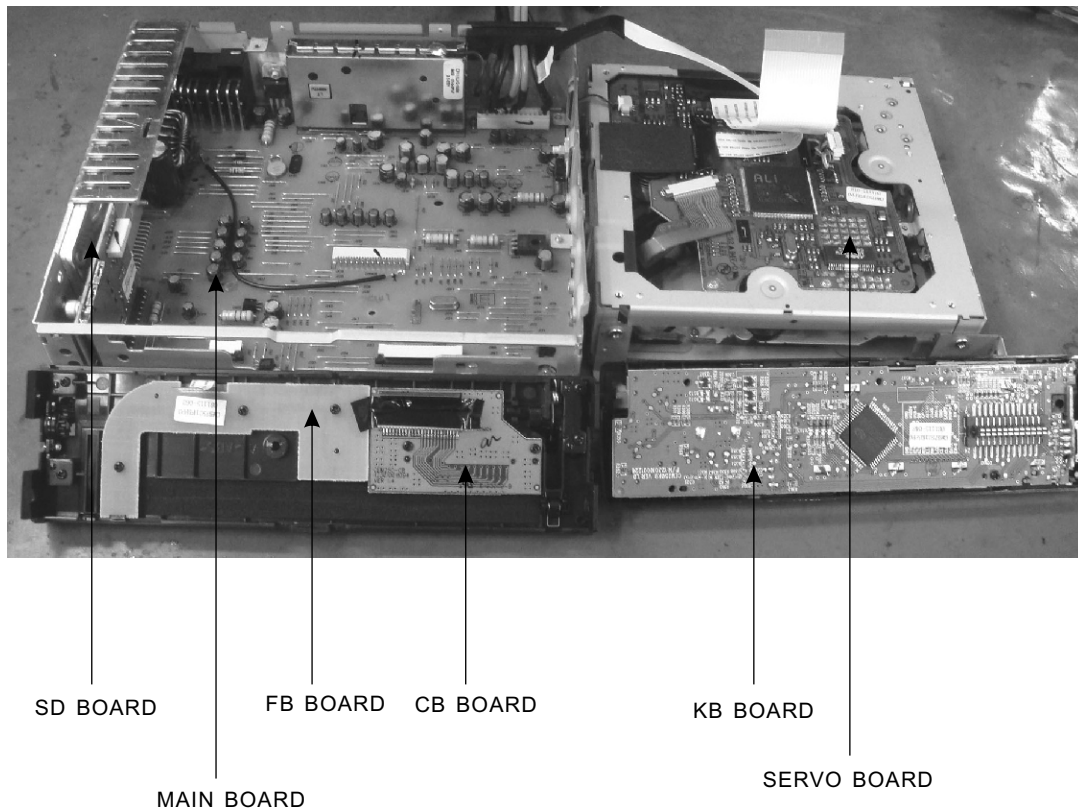
**CLASS 1
LASER PRODUCT**

Version 1.3



PHILIPS

Location of PCBS



VERSION VARIATIONS:

[illegible]

SPECIFICATIONS

■ General

Power supply:	12V DC(11V-16-), negative ground
Fuse:	15V
Suitable speaker impedance:	4-8 Ω
Maximum power output:	45W×4channels
Continuous power output:	22W×4channels(4 Ω 10% T. H. D)
Pre-Amp output voltage:	2. 0V(USB play mode; 1kHz, 0dB, 10k Ω load)
Subwoofer output voltage:	2. 0V(USB play mode; 61kHz, 0dB, 10k Ω load)
Aux-in level:	$\geq 300\text{mV}$
Dimensions(W×H×D):	188×58×128MM
Wight:	1. 0kg

■ Radio

Frequency range	87. 5-108. 0MHz(Eur)
-FM	87. 5-107. 9MHz(Ame)
Frequency range	522-1620kHz(Eur)
-AM(MW)	530-1710MHz(Ame)
Usable sensitivity	8dBu
-FM	
Usable sensitivity	3. 2dBu
-AM(MW)(S/N=20dB)	
Frequency response	20Hz-20kHz
Stereo separation	30db(1kHz)
Signal/noise ratio	>75dB

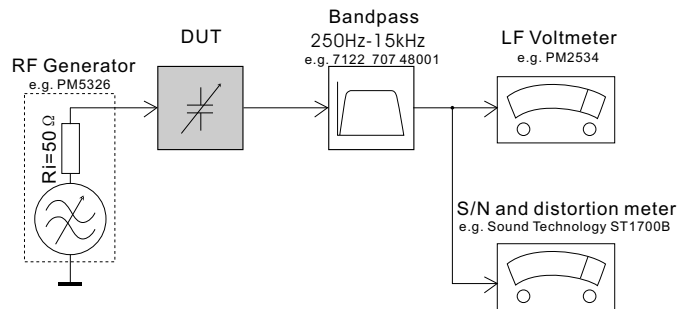
■ Components

Car audio system	1
Remote control	1
Microphone	1
Microphone hold	1
Rubber cushion	1
Disassembly tool	2
Front panel	1
Carrying case for front panel	1
Trim plate	2
Screw	4
User manual	1
Quick start guide	1
Standard connector	1

Note: Specifications and design are subject to change
without notice for product improvements.

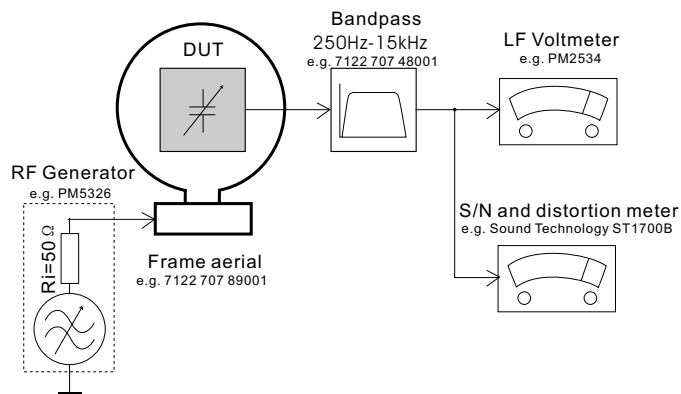
MEASUREMENT SETUP

Tuner FM



Use a bandpass filter to eliminate hum(50Hz, 100Hz) and disturbance from the pilotone(19kHz, 38kHz).

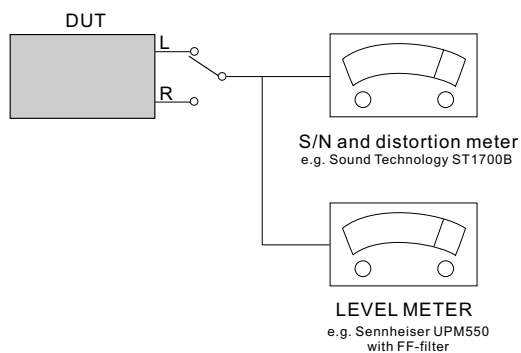
Tuner AM (MW, LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

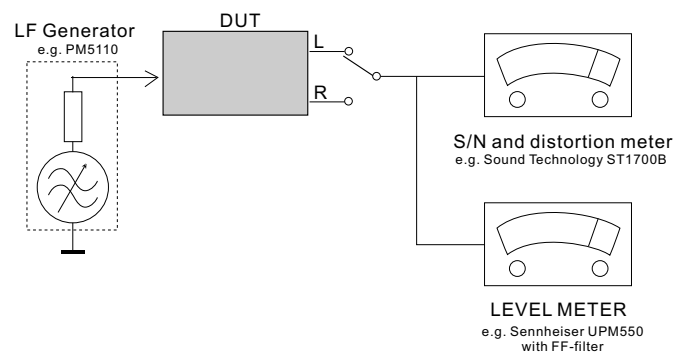
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Cassette

Use Universal Test Cassette **Cr02** SBC419 4822 397 30069
or Universal Test Cassette Fe SBC420 4822 397 30071




SERVICE AIDS

WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

ESD



Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.
Safety components are marked by the symbol .

**CLASS 1
LASER PRODUCT**

INFORMATION ABOUT LEAD-FREE SOLDERING

Philips CE is producing lead-free sets from 1.1.2005 onwards.

IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:



- On our website www.atyourservice.ce.Philips.com you find more information to:
 - * BGA-de-/soldering (+ baking instructions)
 - * Heating-profiles of BGAs and other ICs used in Philips-sets
 - * Lead free

You will find this and more technical information within the "magazine", chapter "workshop news".

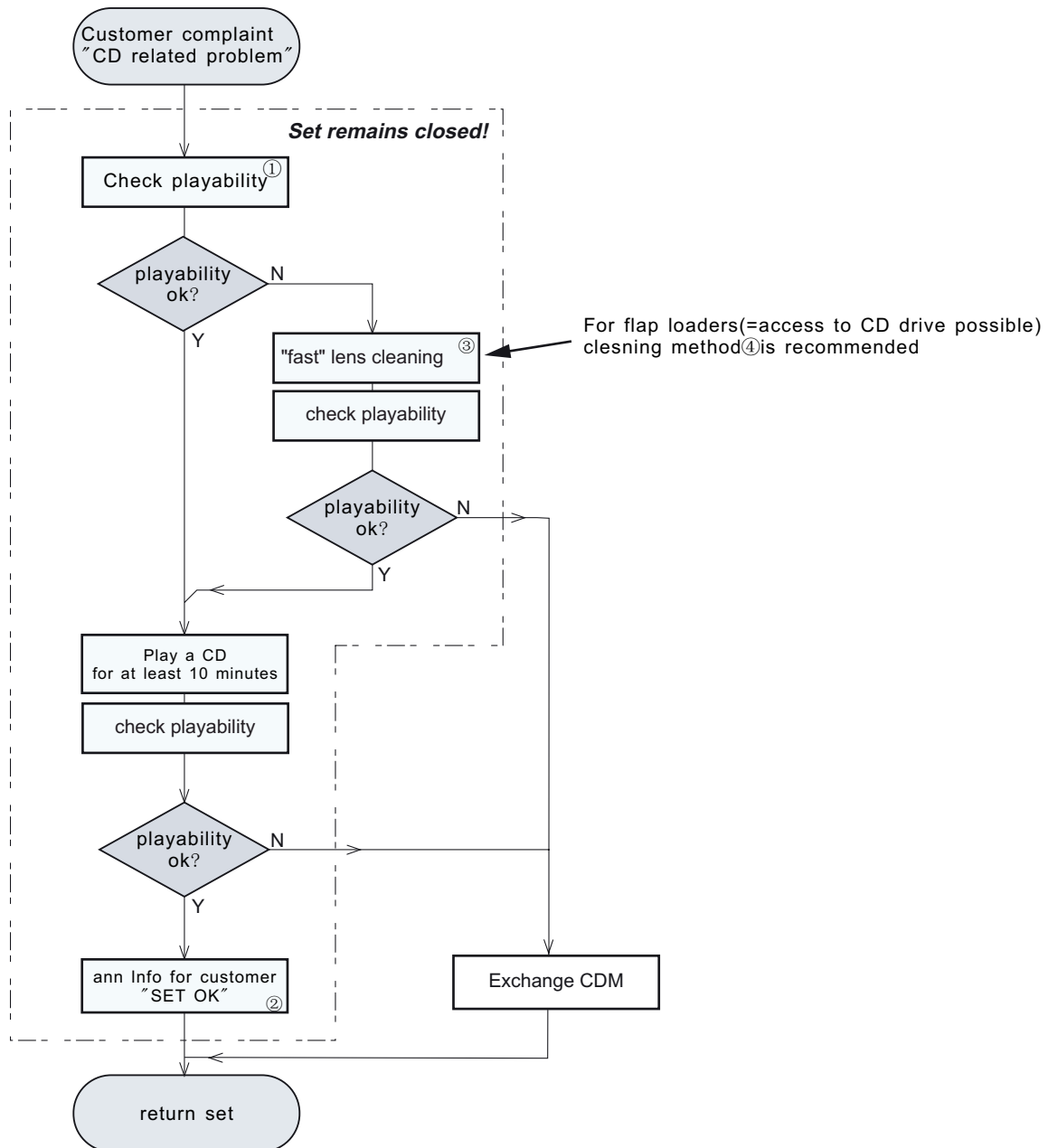
For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

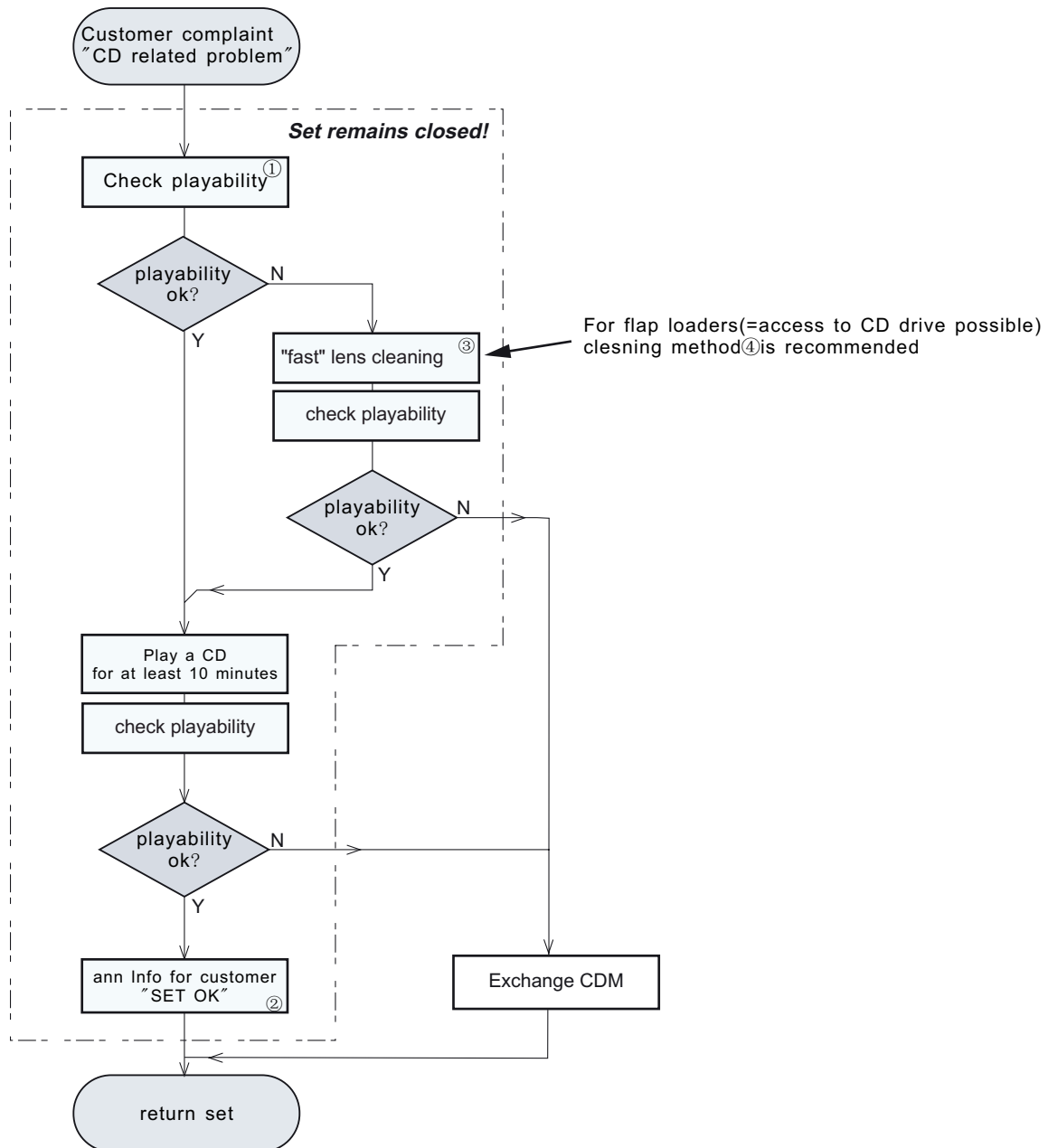
- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):
 1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
 2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
 3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
 4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

INSTRUCTIONS ON CD PLAYABILITY



①-④For description-see following pages

INSTRUCTIONS ON CD PLAYABILITY



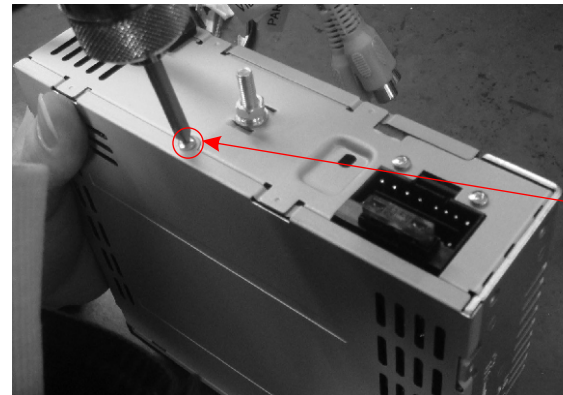
①-④For description-see following pages

2-1

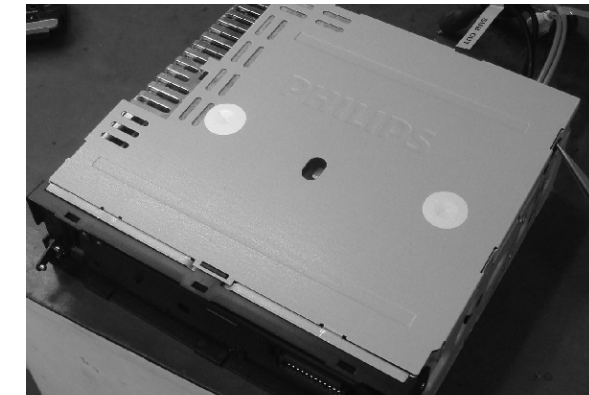
Disassembly Diagram



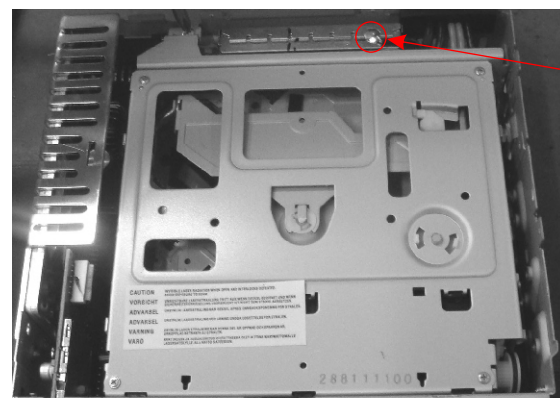
1. Remove the mounting sleeve with the removal keys. Press key and remove the front panel.



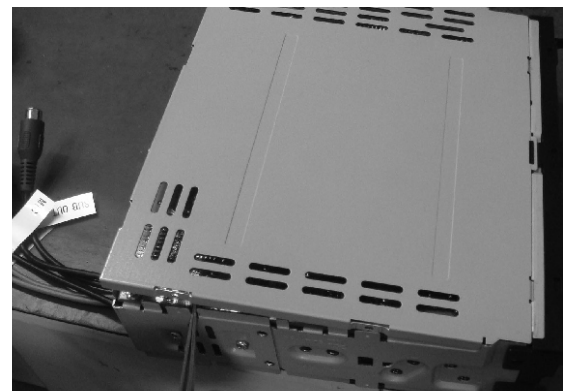
2. Remove the two screws on the back side of the unit with a screw driver.



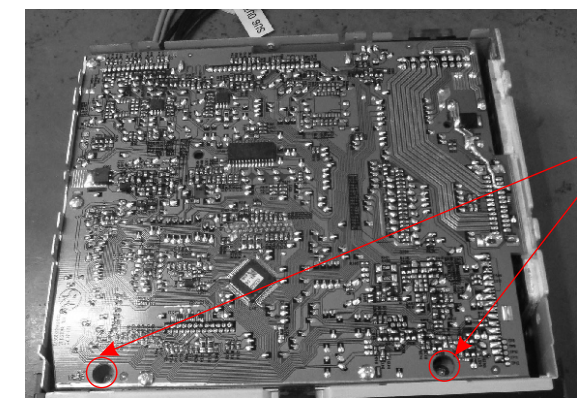
3. Remove the upper cover with a tool.



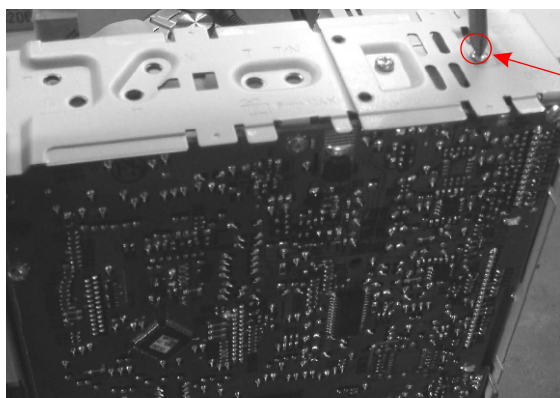
4. Remove the screw 3 as shown.



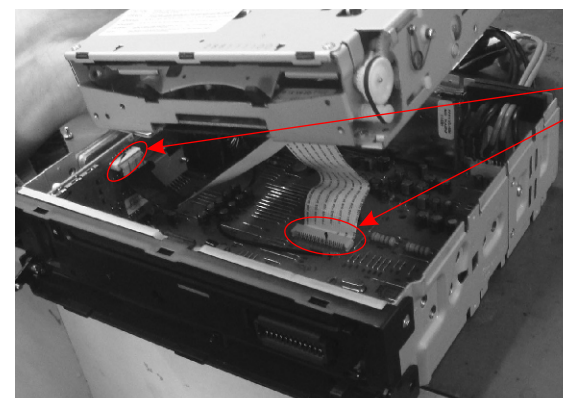
5. Remove the bottom cover with a tool.



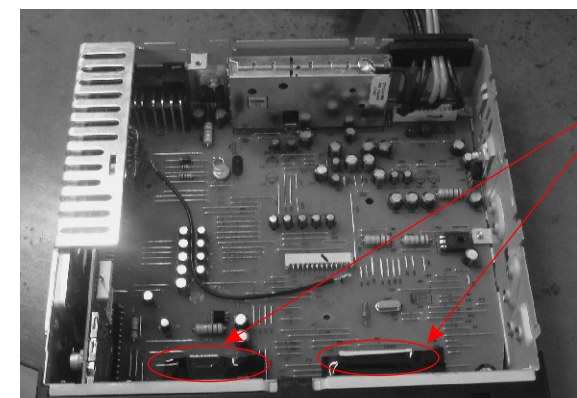
6. Remove the screws 4 with a screw driver.



7. Remove the screw 5 with a screw driver.



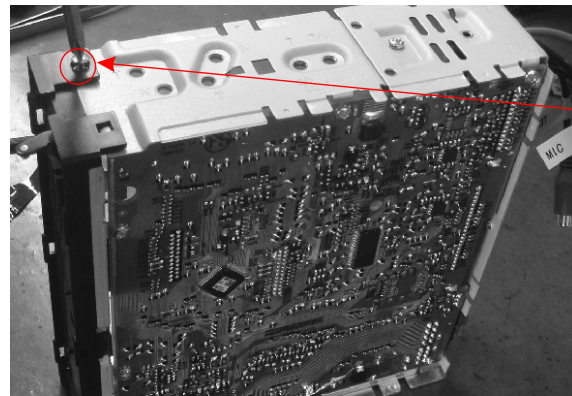
8. Remove the connectors 6, and then remove the mechanism core.



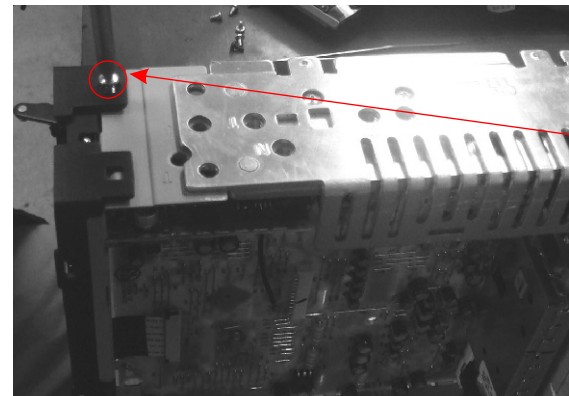
9. Remove the adhesive tapes 7.

2-2

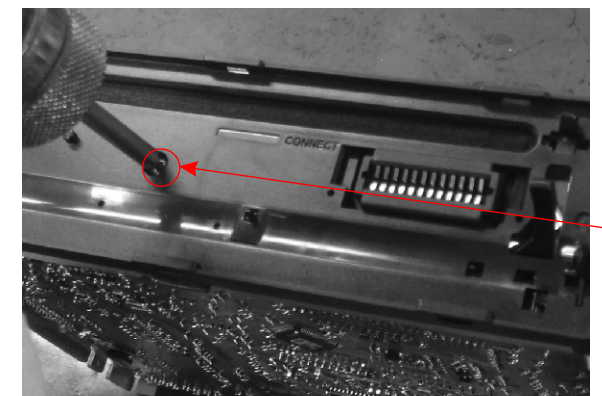
Disassembly Diagram



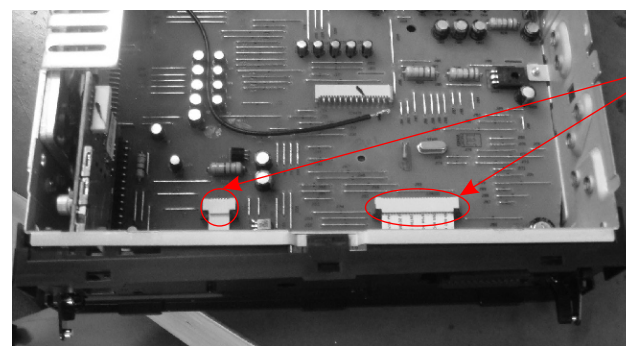
10. Remove the screw 8 .



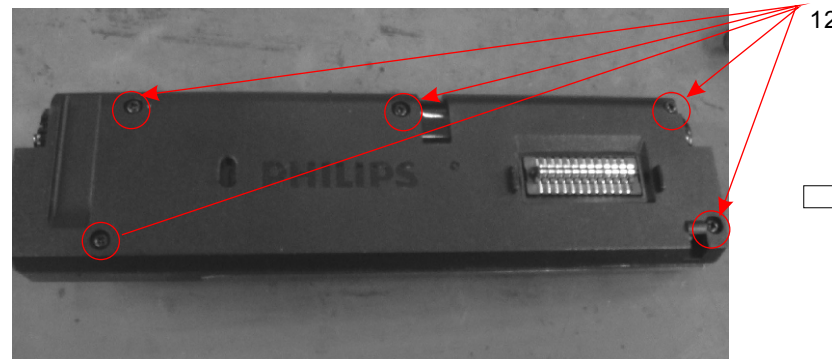
11. Remove the screw 9 .



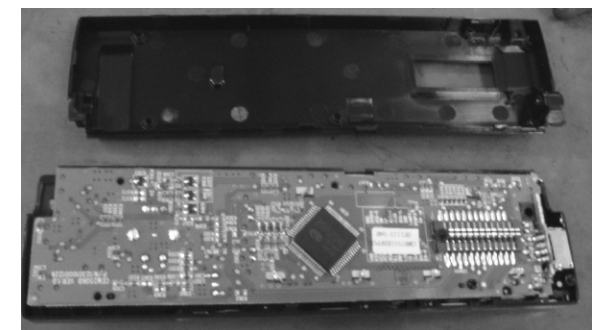
12. Remove the screw 10 .



13. Remove the connectors 11, and then remove the bracket with a tool.




14. Remove the screws 12.



Software version check & upgrade

1、Check Servo software version

In USB/SD/Disc mode, press DISP + 6 simulatiously for 2 sec, LCD display is as below:

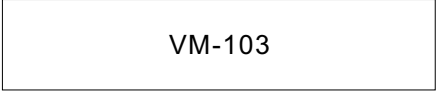


VS-104

102 is the servo software version

2、Check MCU software version

In tuner mode, press DISP + 6 simulatiously for 2 sec, LCD display is as below:

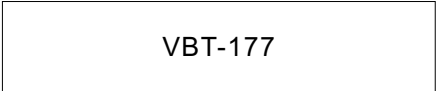


VM-103

101 is the MCU software version

3、Check BT software version

In tuner mode, press DISP + 5 simulatiously for 2 sec, LCD display is as below:



VBT-177

177 is the MCU software version

Upgrade software

- 1、Copy servo software "BOOT.ALI" and "nemo.bin" into USB memory, plug the USB memory into USB socket. Device upgrade servo software automatically, Don't power off or disconnect power during the upgrade, LCD show:



SERVO UPGRADING,,,DON'T PWR OFF

Around 1 minute, servo software upgrade completed and device change to radio mode automatically

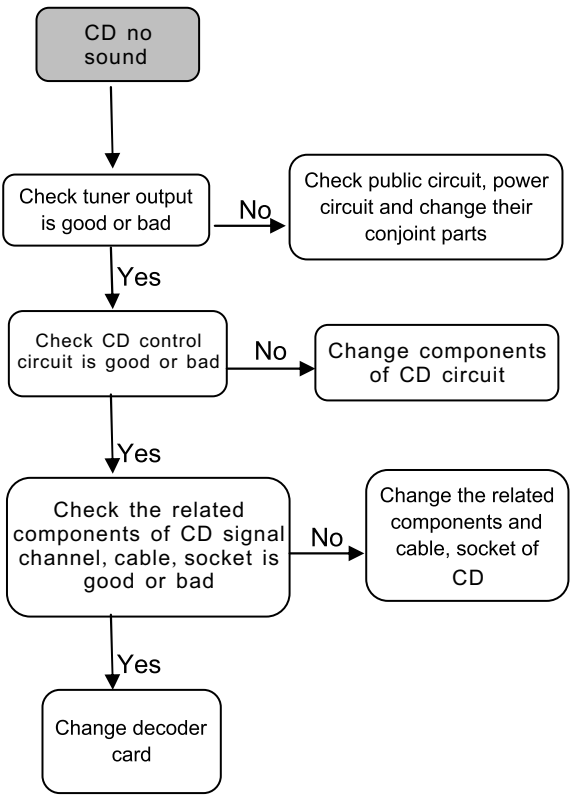
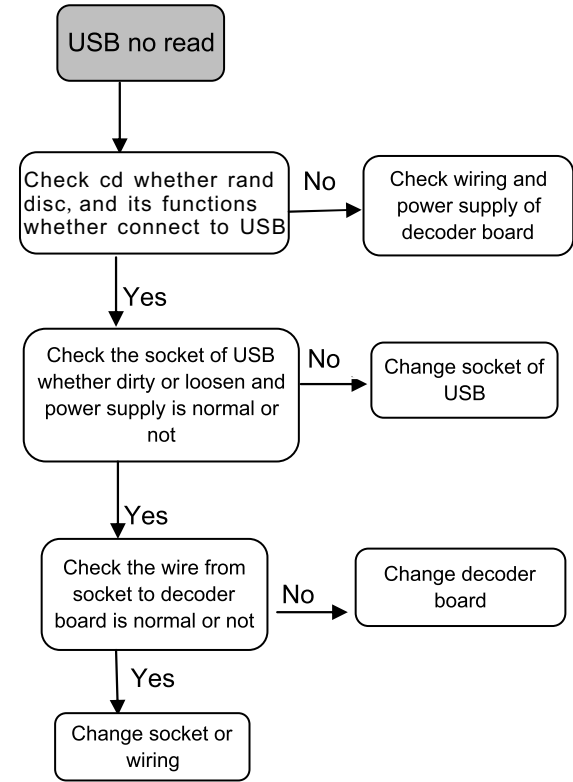
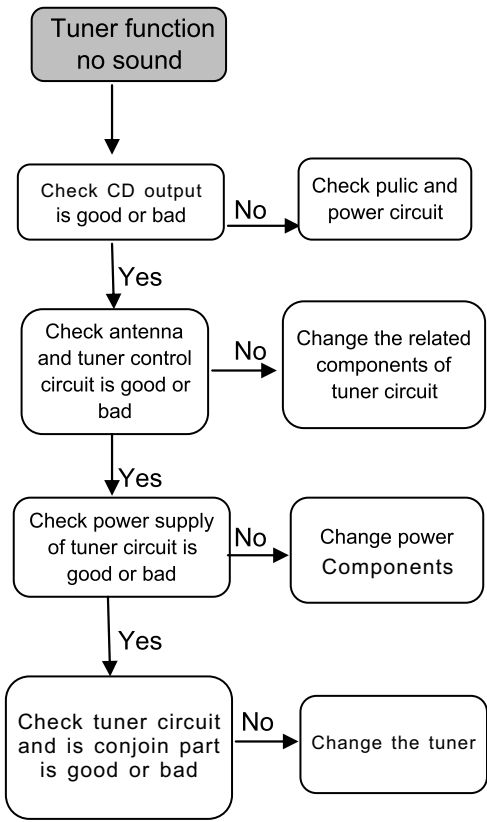
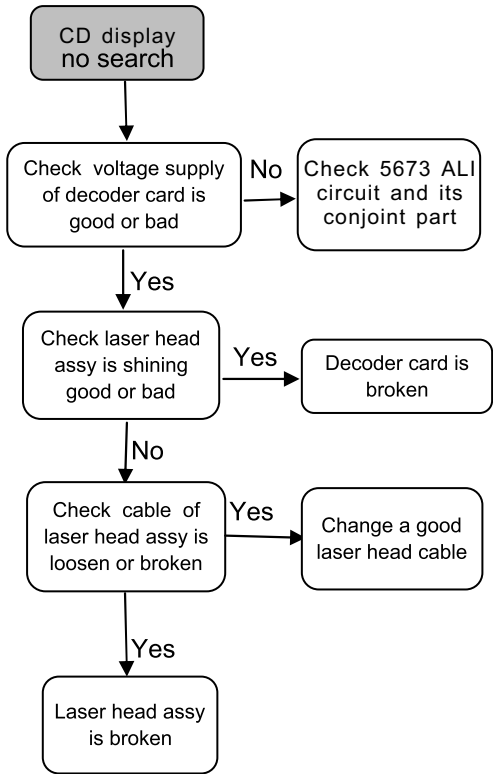
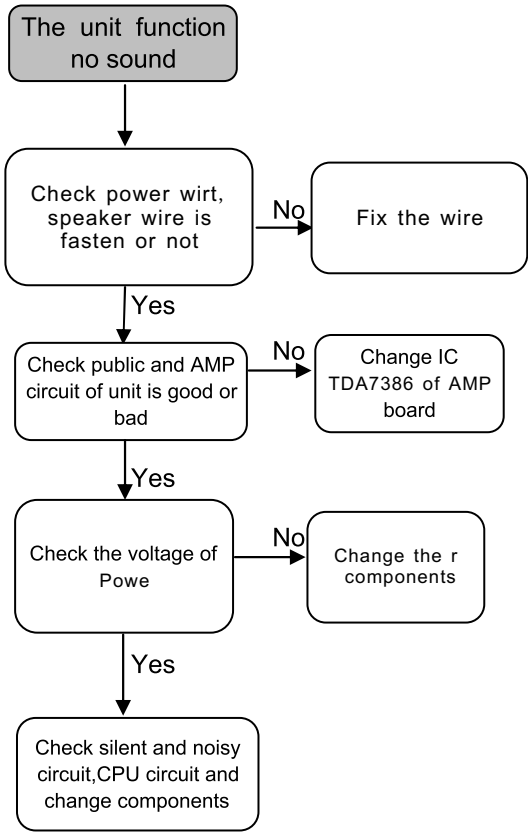
- 2、Delete the servo software in the USB and copy the MCU software "CEM250MCU" (for CEM250) into USB memory, plug the USB memory into USB socket. Device upgrade MB software software automatically Don't power off or disconnect power during the upgrade, LCD show:



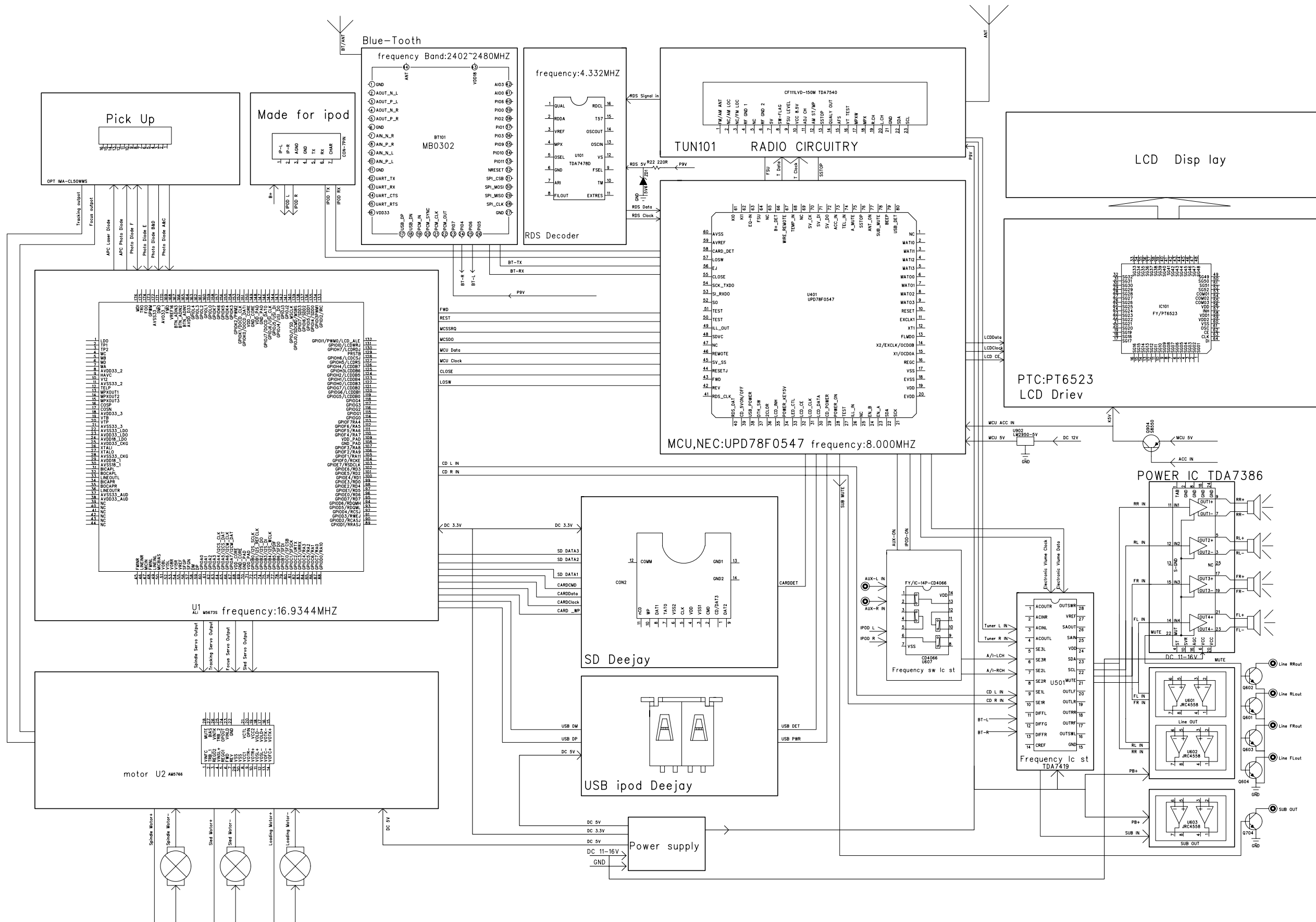
MCU UPG

Around 1 minute, MB software upgrade completed and device power off automatically, disconnect the USB memory.

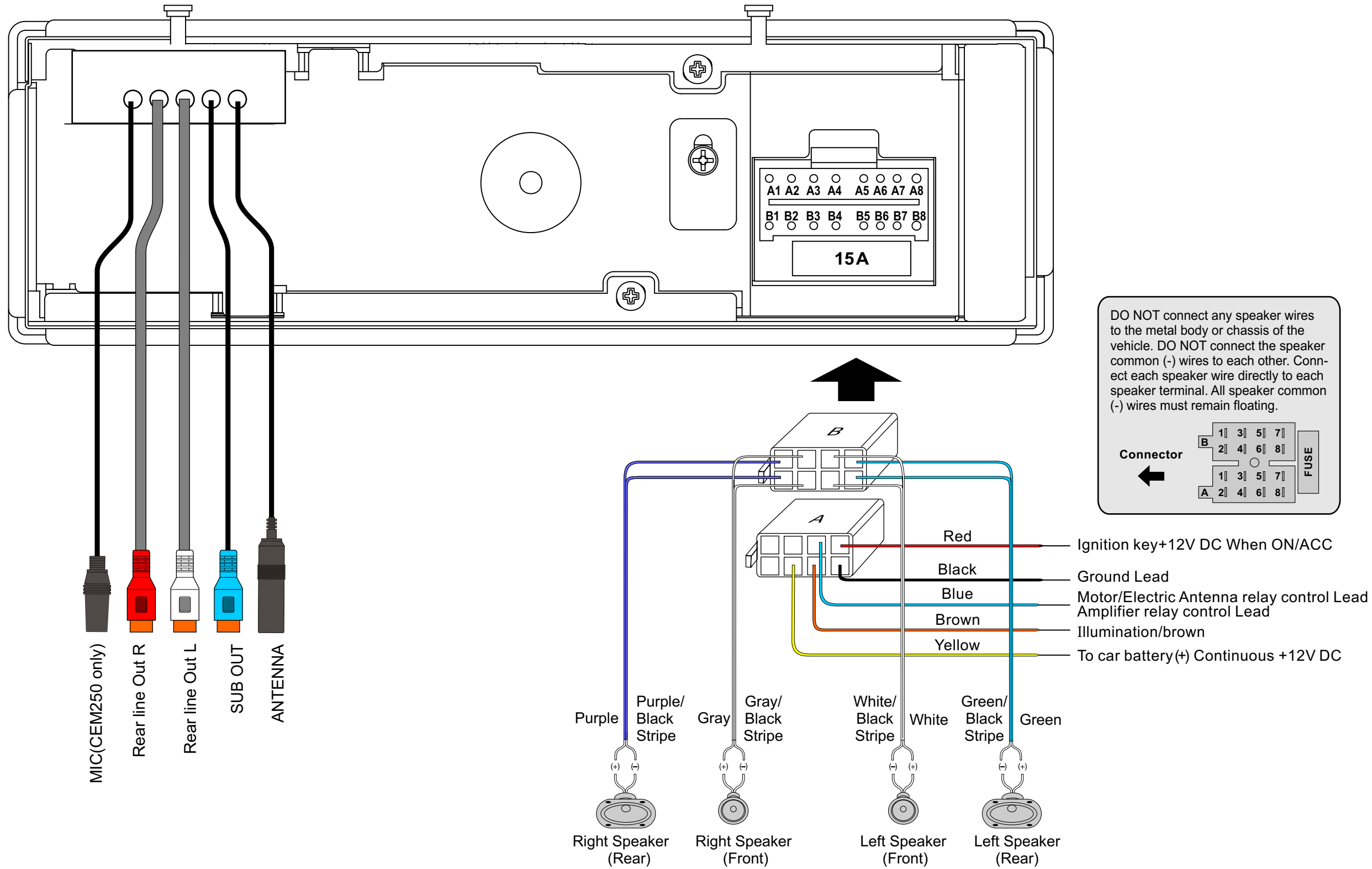
Malfunction check chart

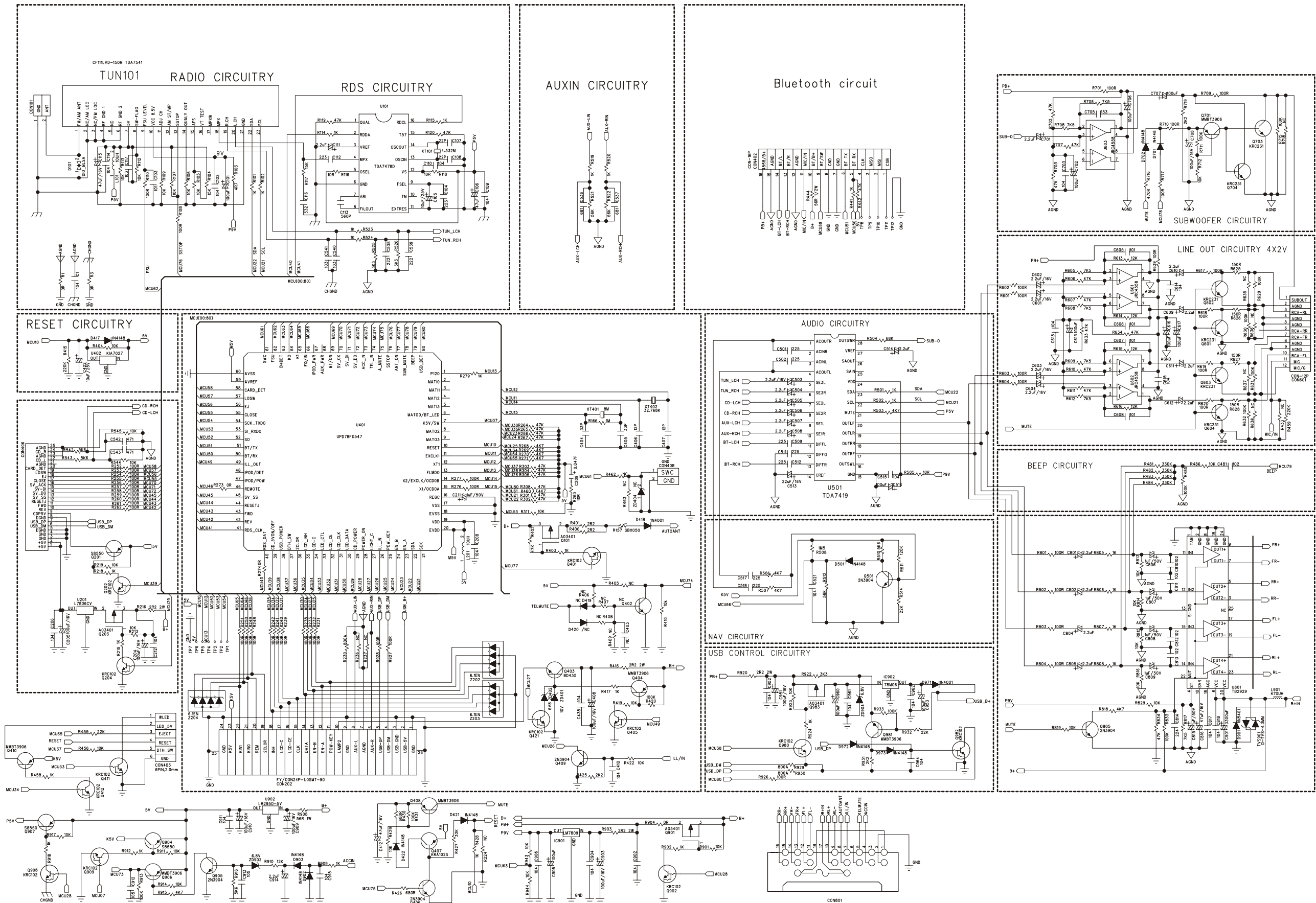


SET BLOCK DIAGRAM

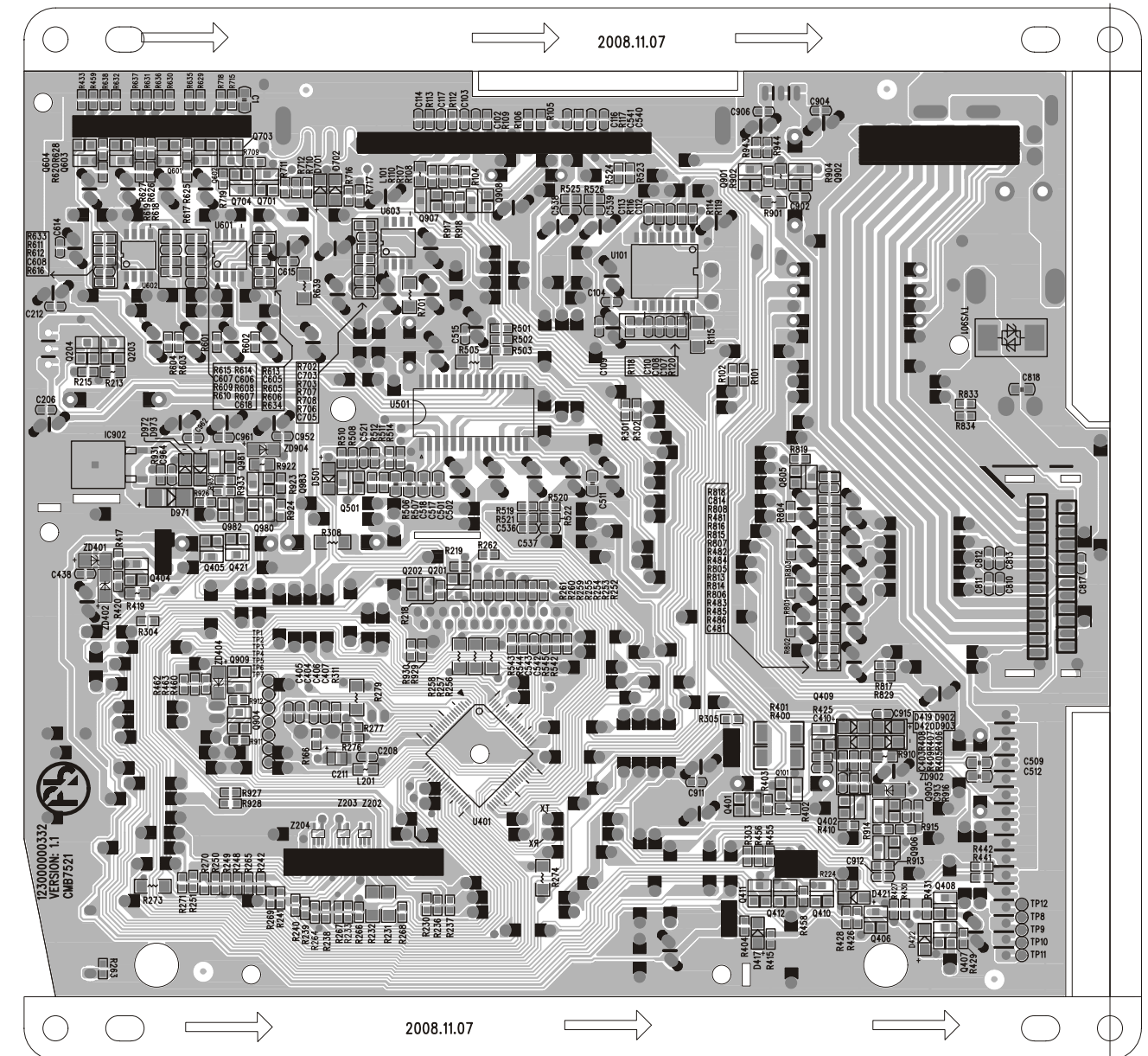
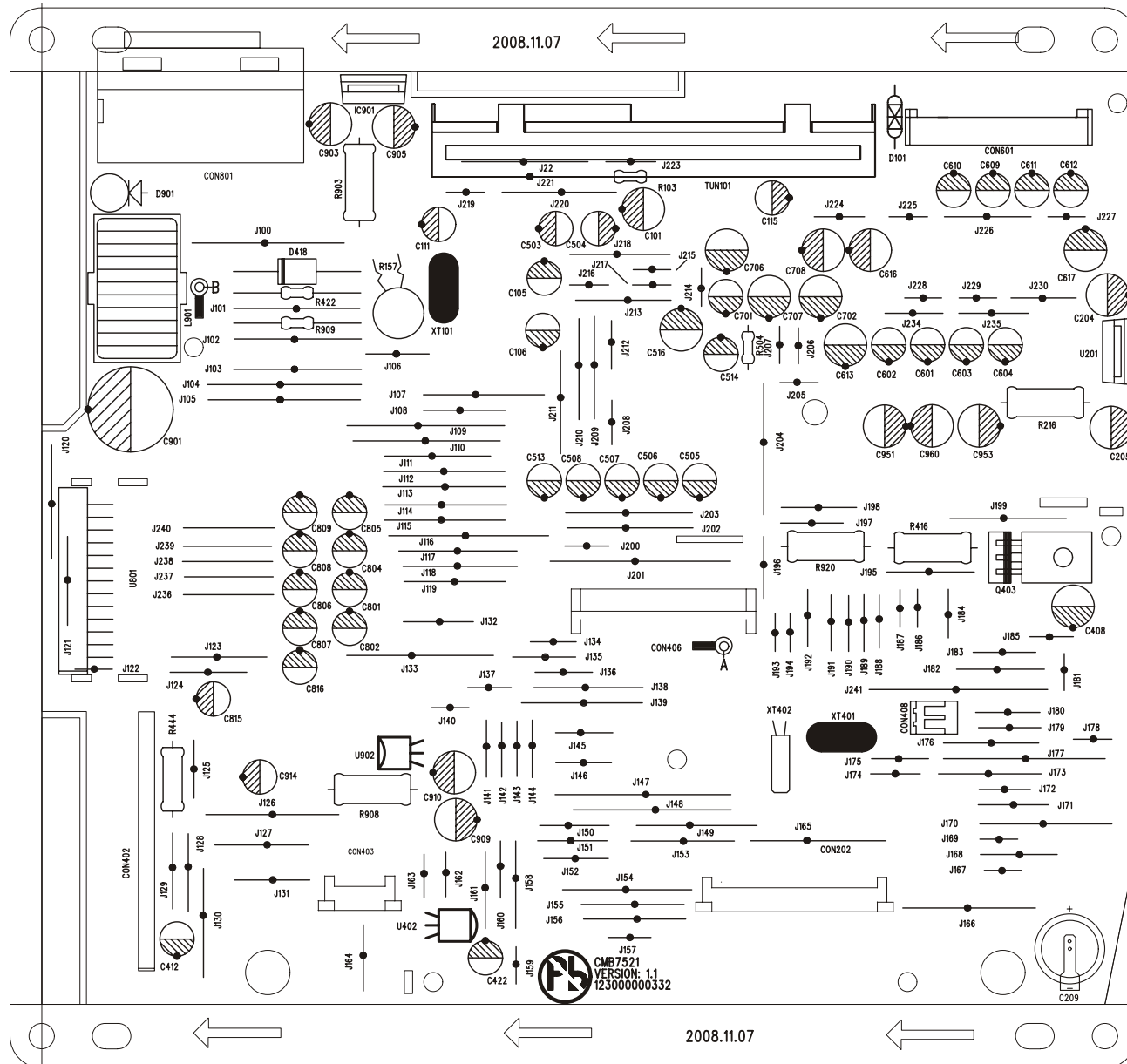


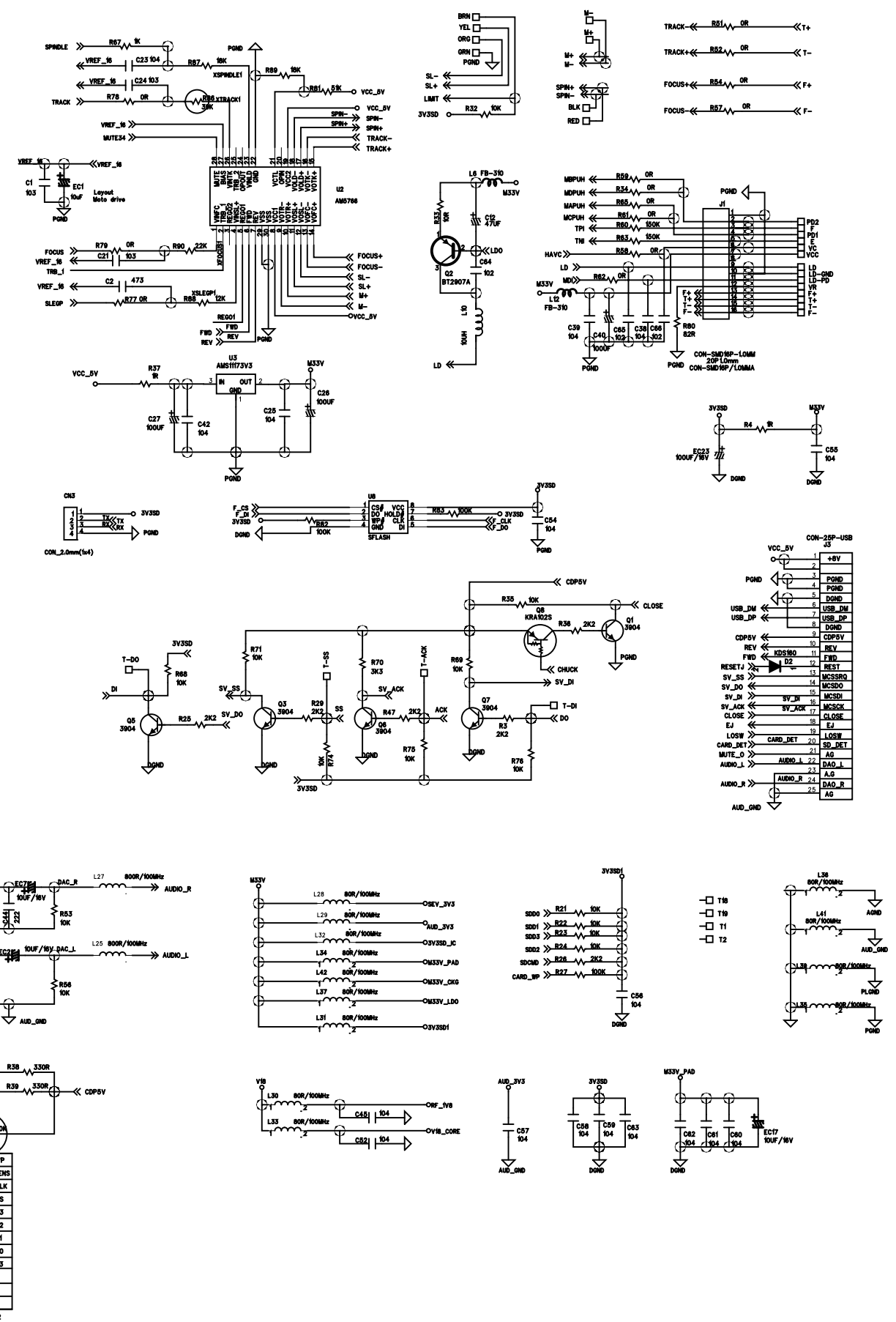
WIRING DIAGRAM



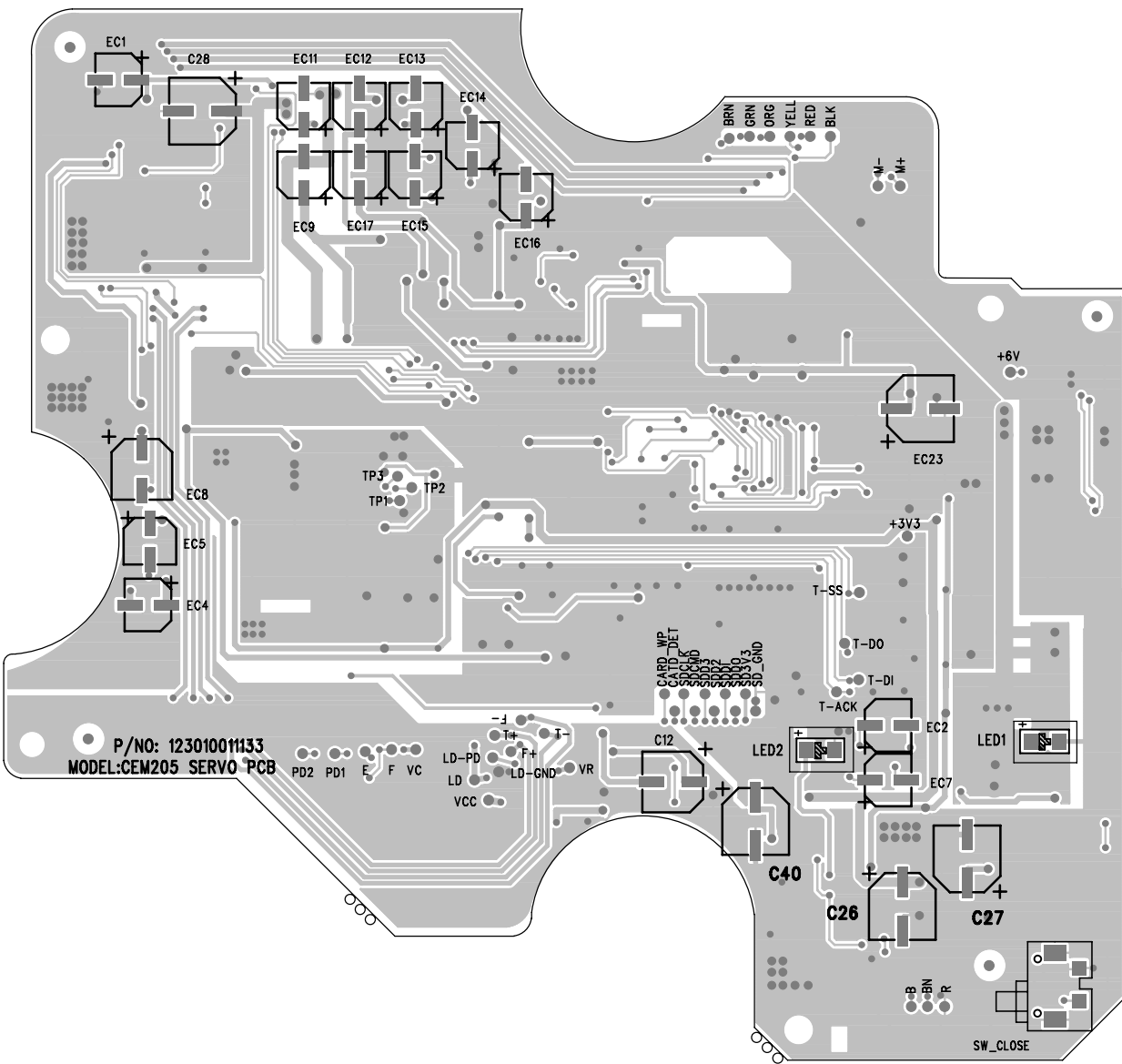
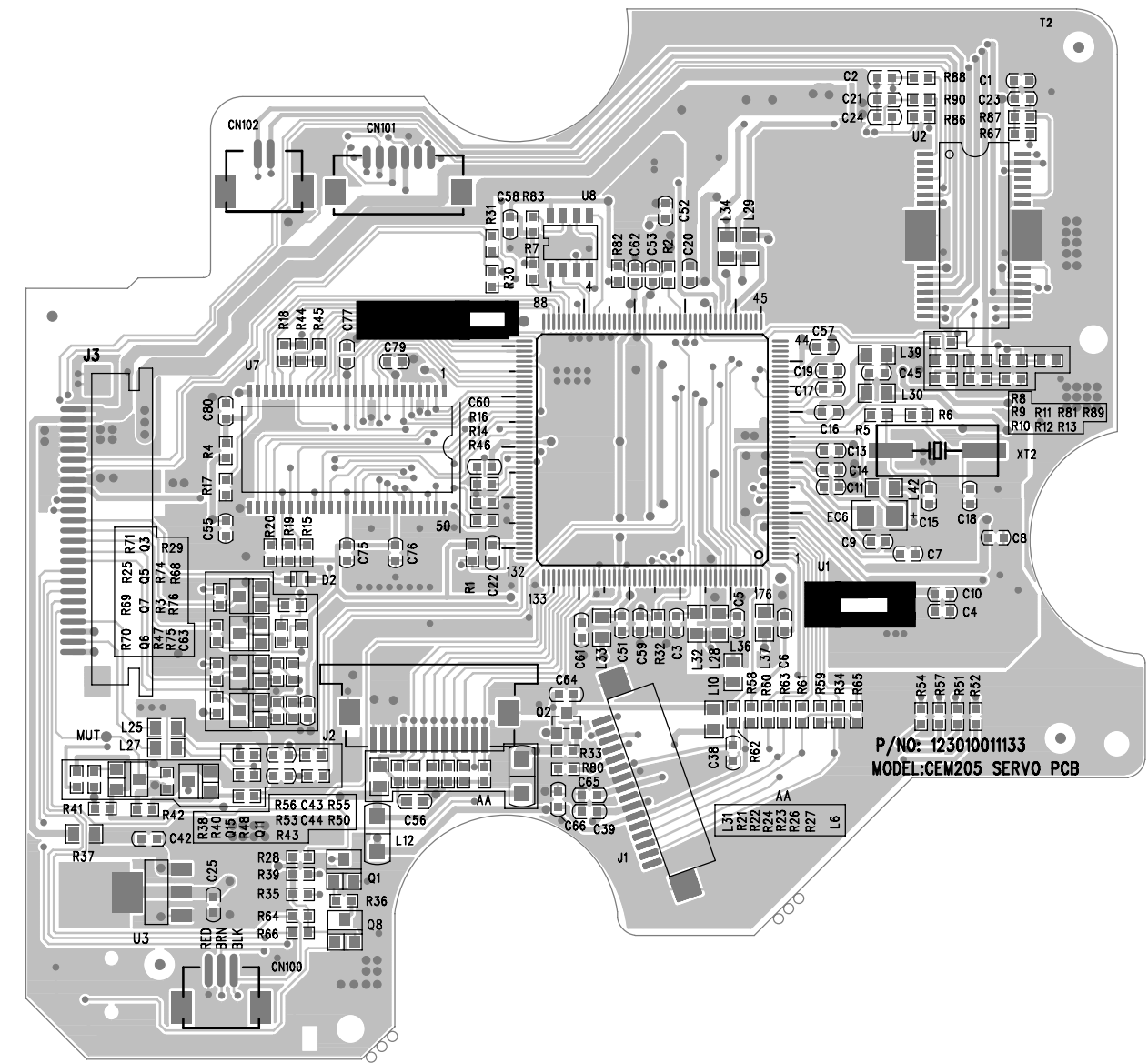


MAIN BOARD-PCB LAYOUT TOP/BOTTOM VIEW

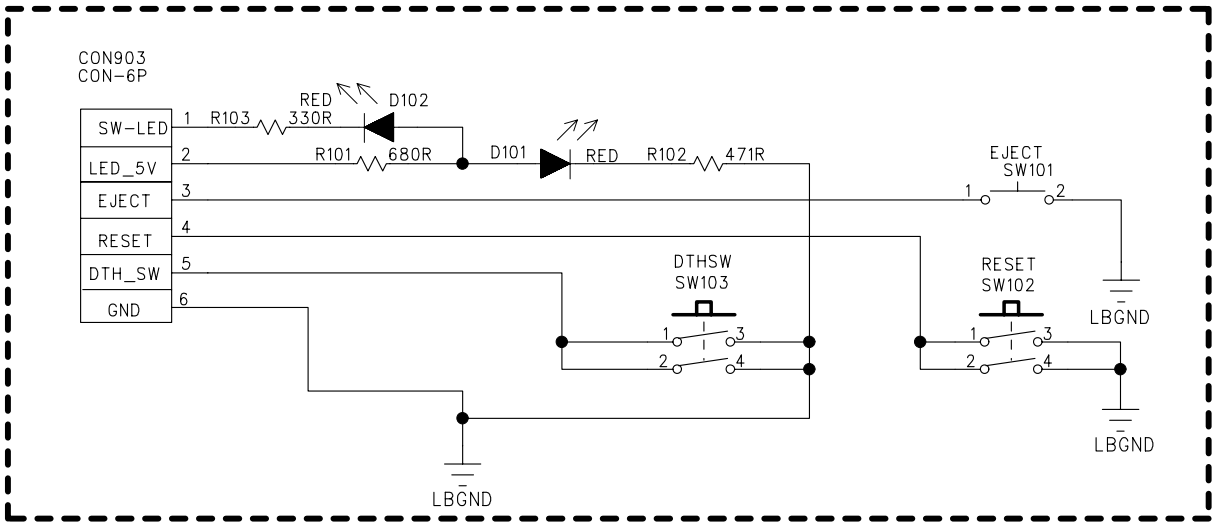
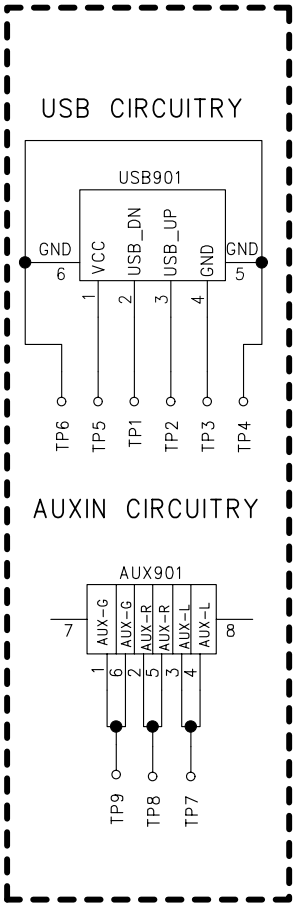
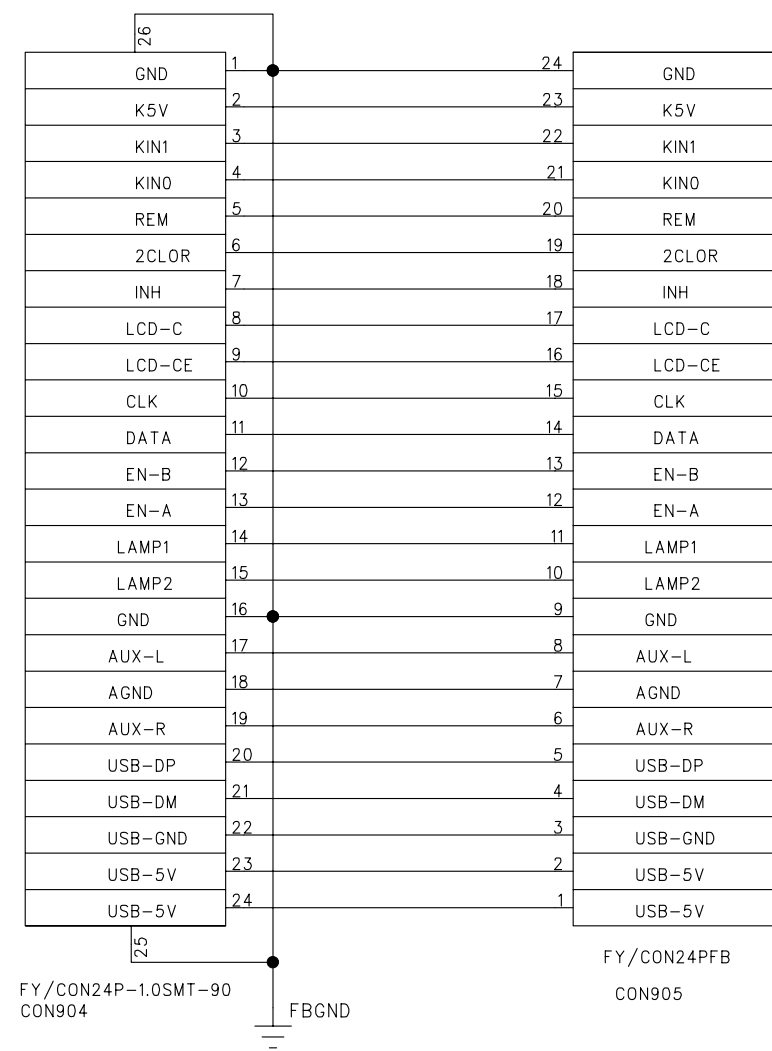




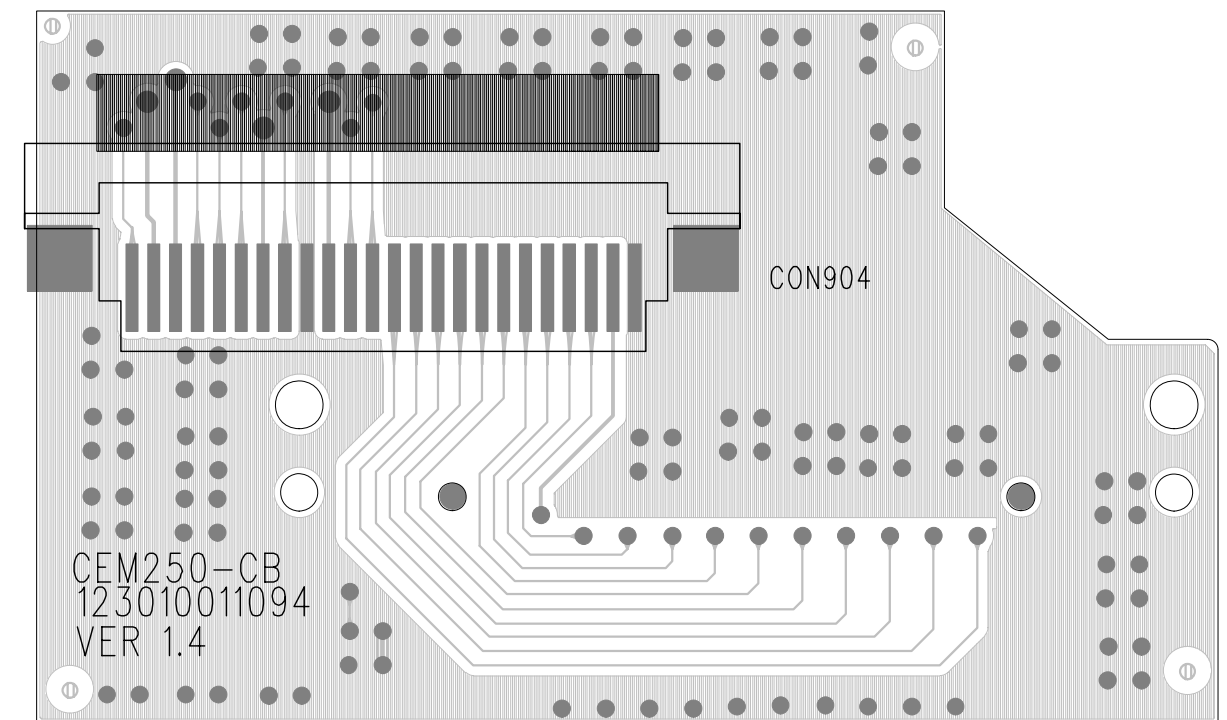
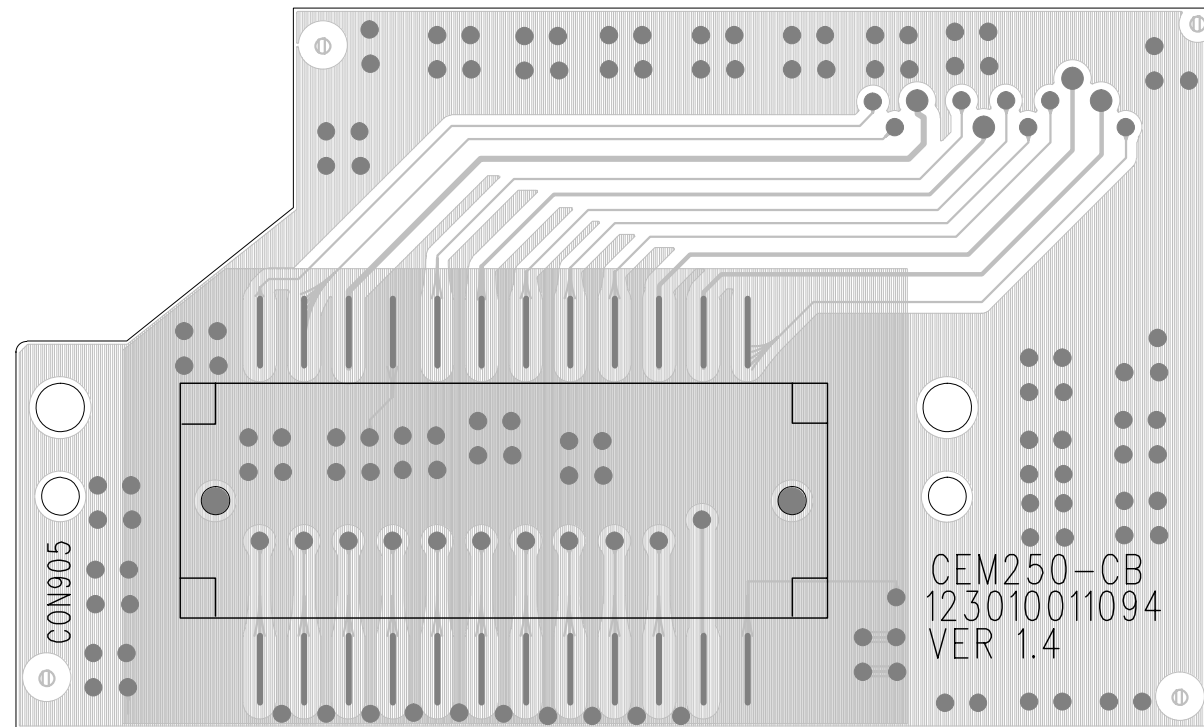
SERVO BOARD-LAYOUT DIAGRAM TOP/BOTTOM VIEW



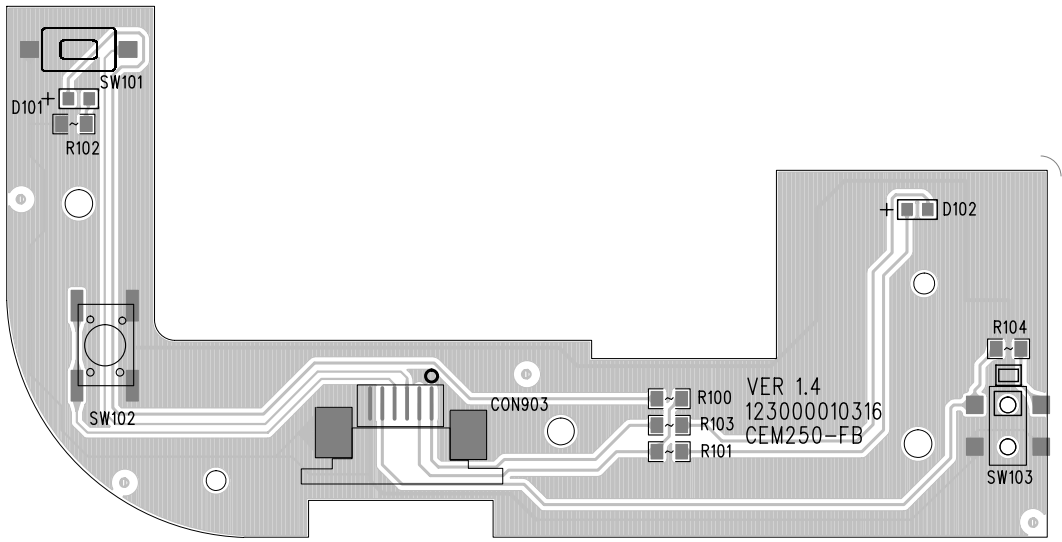
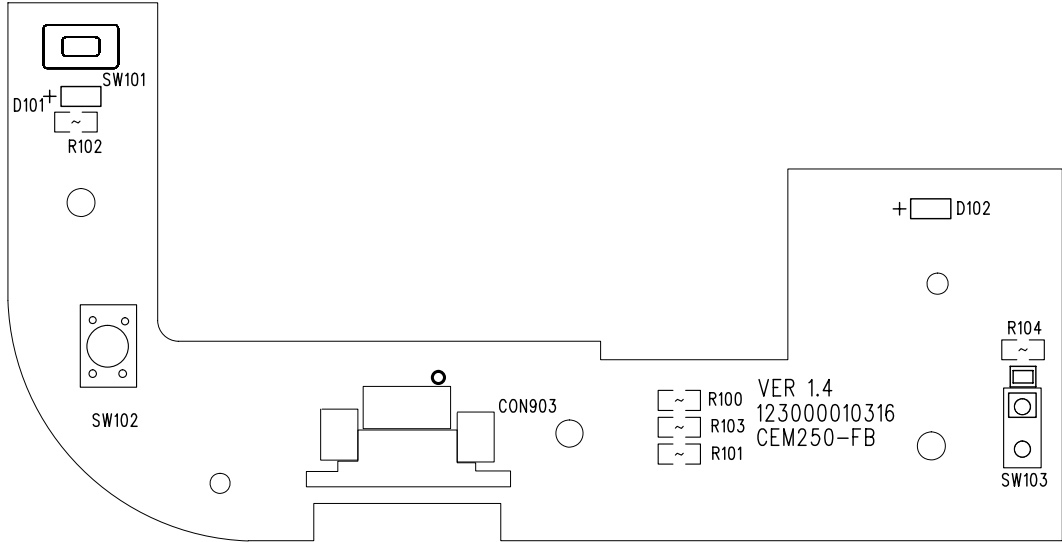
CB/FB/USB BOARD-CIRCUIT DIAGRAM



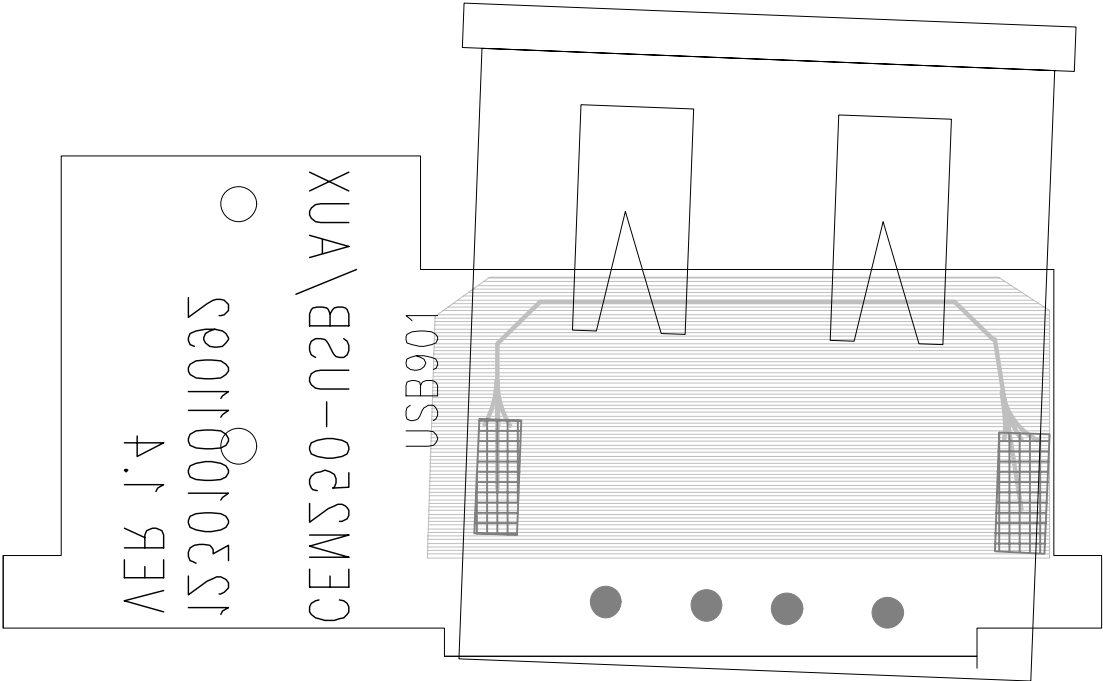
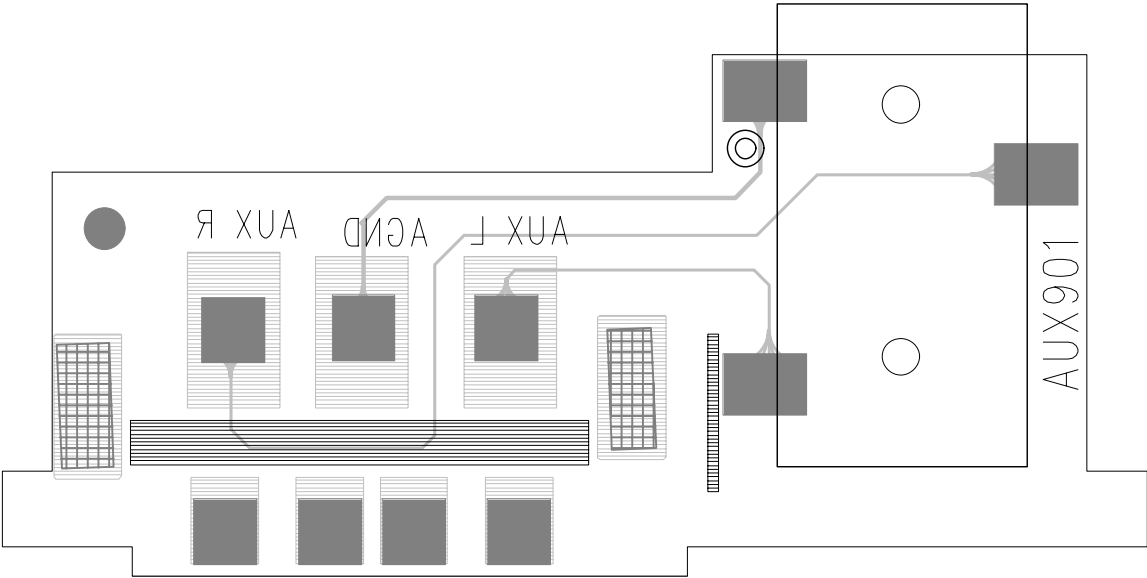
CB BOARD-PCB LAYOUT TOP/BOTTOM VIEW



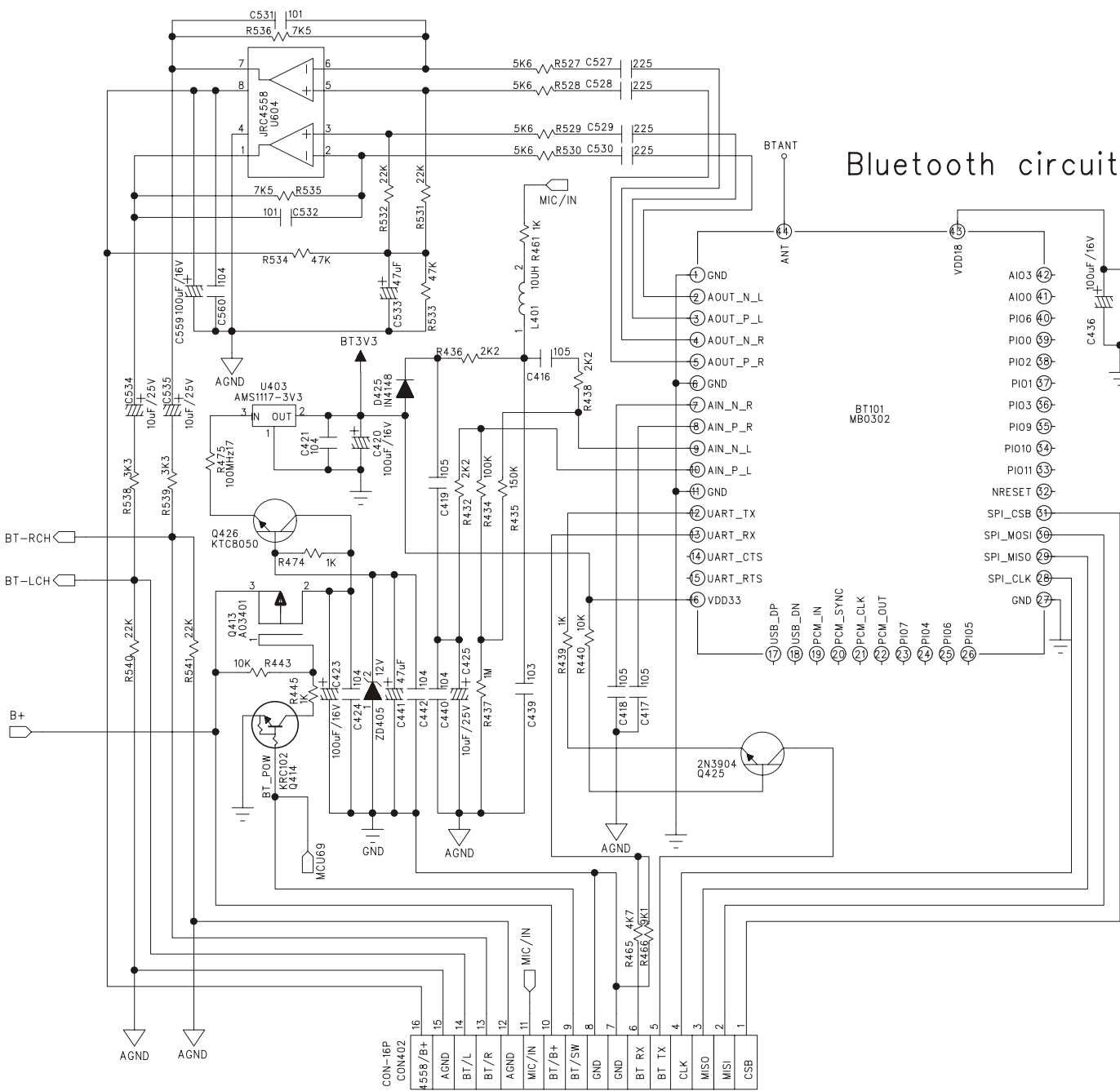
FB BOARD-PCB LAYOUT TOP/BOTTOM VIEW



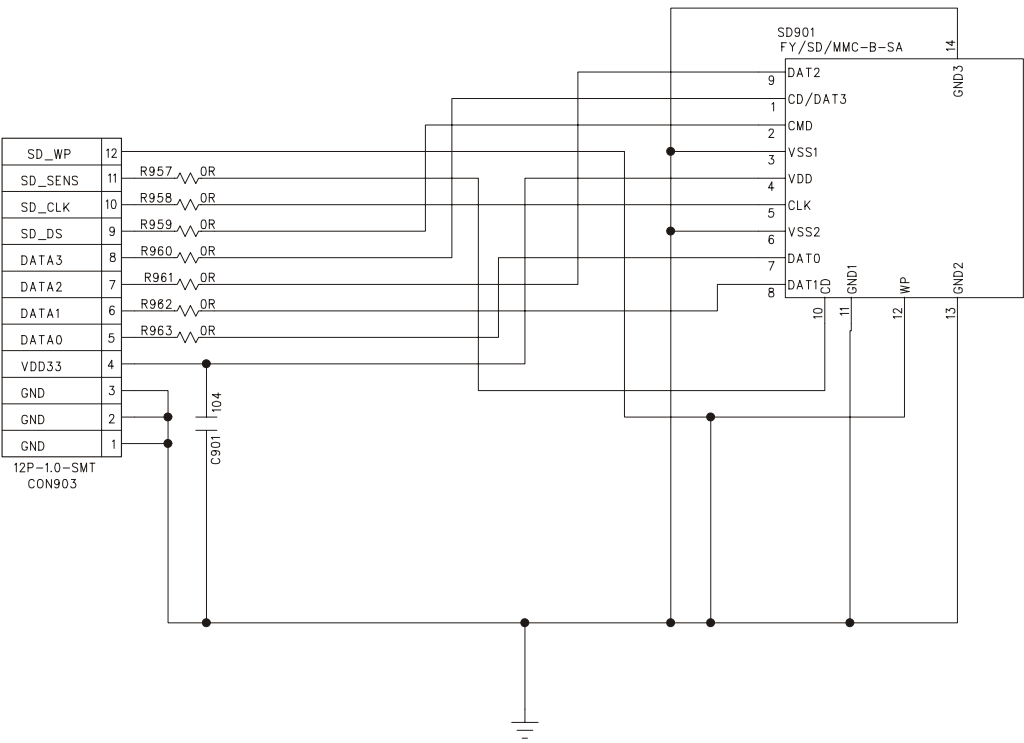
USB BOARD-PCB LAYOUT TOP/BOTTOM VIEW



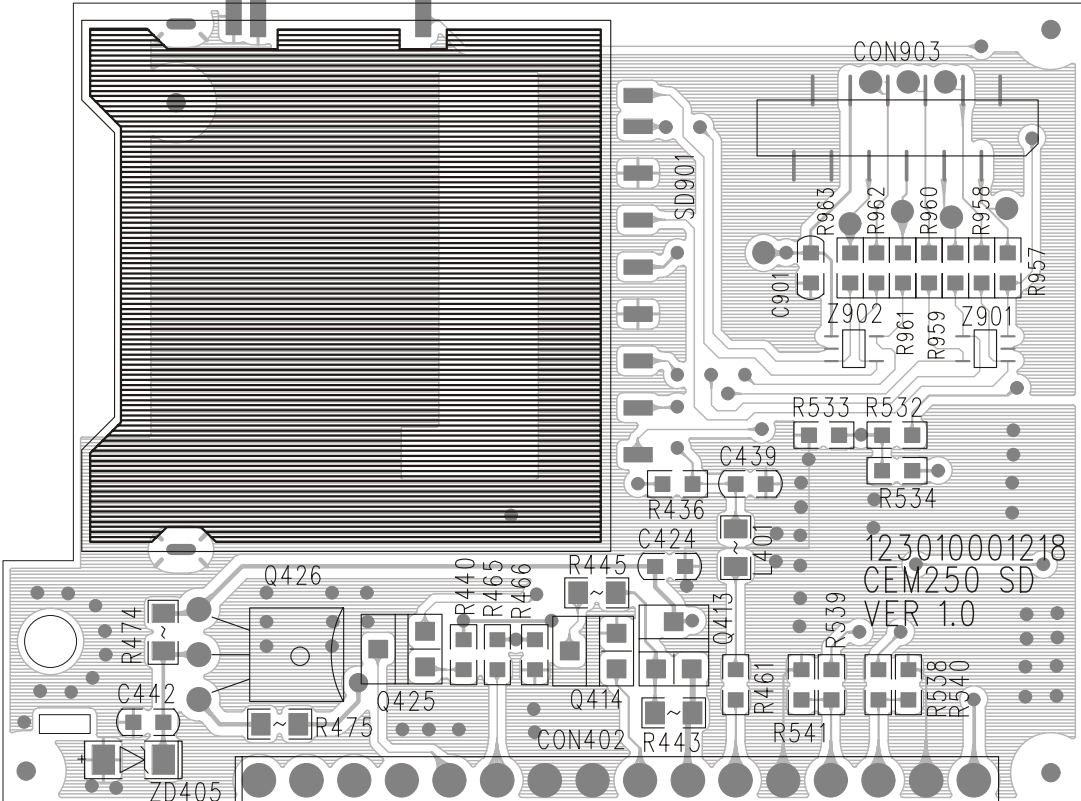
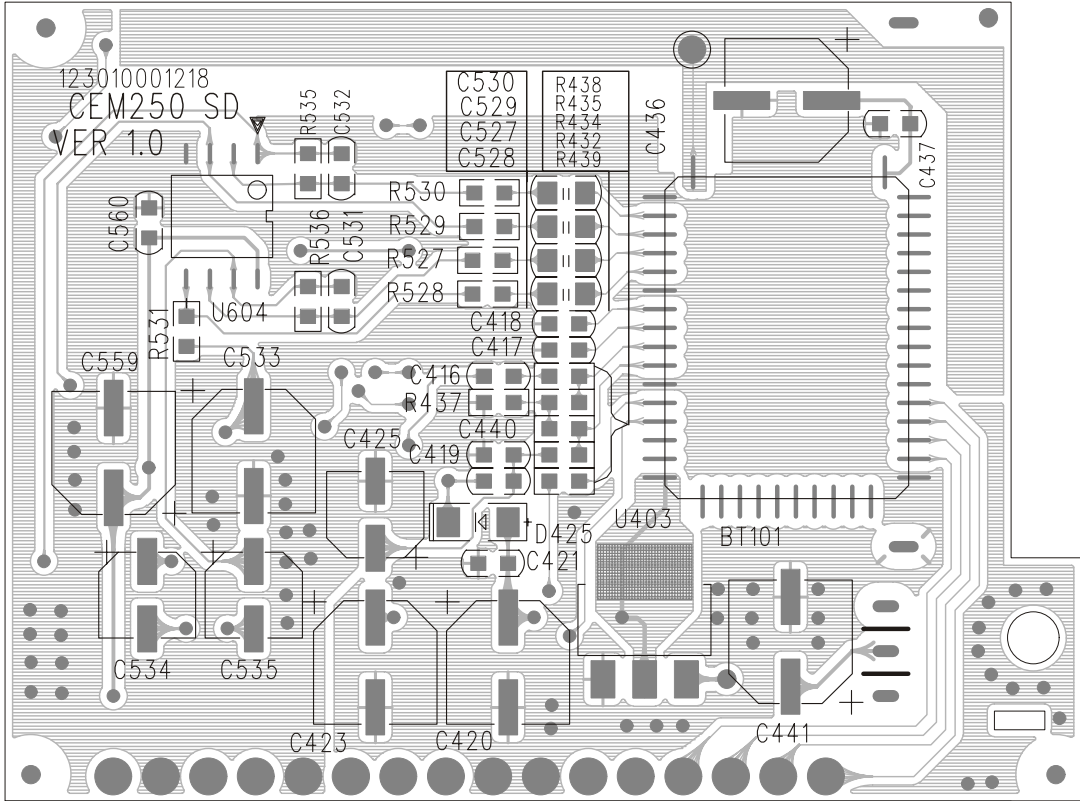
SD BOARD-CIRCUIT DIAGRAM



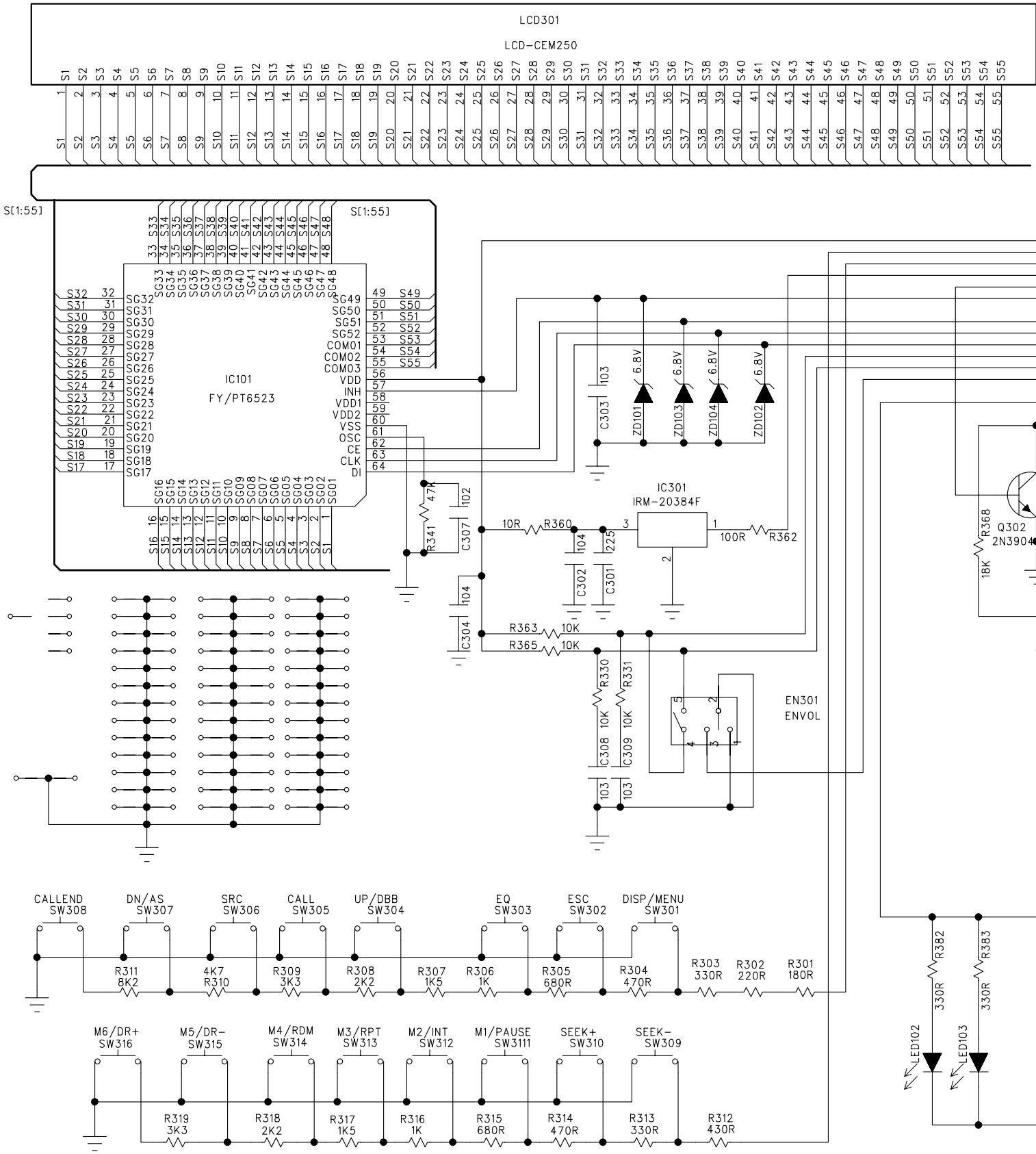
SD CIRCUITRY

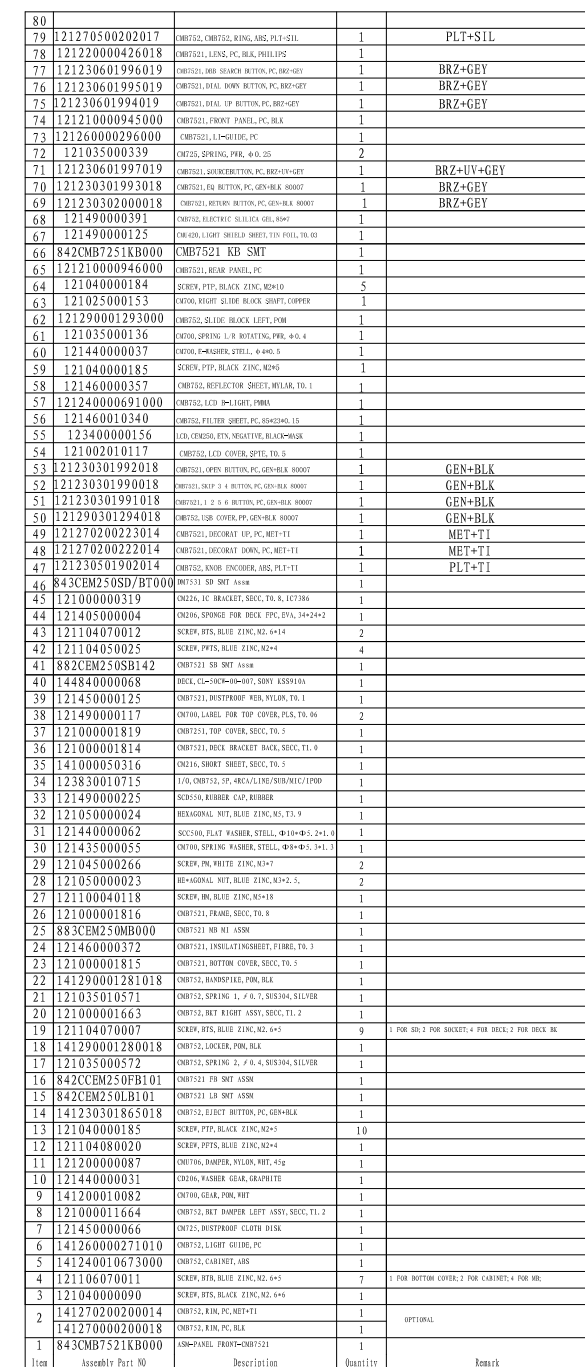


SD BOARD-PCB LAYOUT TOP/BOTTOM VIEW



KB BOARD-CIRCUIT DIAGRAM





MECHANICAL & ACCESSORIES PARTS LIST

1	996510019813	DECORAT DOWN	C	996510019783	ANT CEM250 BLUETOOTH 170MM
2	996510019812	DECORAT UP	D	996510019784	I/O CABLE 2RCA/LINE/SUB/MIC
3	996510019814	LENS BLK PHILIPS	E	996510019543	I/O CABLE 16P ACC/ILL IN/SPK
4	996510019804	1 BUTTON	F	996510019729	FFC 6P 1.0mm 35mm TYPE A
5	996510019805	3 BUTTON	Q	996510019829	REMOTE CONTROL
6	996510019806	5 BUTTON	5A	996510019646	CMV100 SIDE KEY
7	996510019802	EQ BUTTON	7A	996510019785	FFC 24P 1.0mm 32mm TYPE C
8	996510019803	RETURN BUTTON			
9	996510019801	DISP BUTTON			
10	996510019815	USB COVER			
11	996510019837	FRONT PANEL			
12	996510019818	BUTTON BRACKET 1			
13	996510019807	OPEN BUTTON			
14	996510019607	SPRING PWR D0.25			
16	996510019840	LCD ETN			
18	996510019839	LCD BACKET			
27	996510019838	REAR PANEL			
29	996510019810	UP BUTTON LI-GUIDE			
30	996510019811	DOWN BUTTON LI-GUIDE			
31	996510019800	SKIP BUTTON			
32	996510019819	BUTTON SHADE			
33	996510019816	BKT FOR SOURCE BUTTON			
34	996510019817	BUTTON BRACKET			
35	996510019799	SOURCE BUTTON			
37	996510019796	DIAL UP BUTTON			
38	996510019797	DIAL DOWN BUTTON			
39	996510019798	DBB AS BUTTON			
40	996510019809	RING			
41	996510019808	KNOB ENCODER			
101	996510019836	FRONT PANEL ASSY			
102	996510019786	RIM			
104	996510019780	CABINET			
105	996510019781	LIGHT GUIDE			
107	996510019642	CM700 GEAR			
109	996510019641	DAMPER			
111	996510019782	EJECT BUTTON			
112	996510019644	CMB752 SPRING 1 D0.6			
113	996510019638	CMB752 HANDSPIKE			
114	996510019639	CMB752 LOCKER			
115	996510019643	CMB752 SPRING 2 D0.4			
129	996510020151	SERVO BOARD & CD MECHANISM			
136	996510019645	SCD550 RUBBER CAP RUBBER			
141	996510020150	CE250 MAIN BOARD			

Note: 1) Only these parts mentioned in the list are normal service parts.

2) For Key Board module, please order 996510019836 FRONT PANEL ASSY which contains Key Board.

3) For Main Board & Servo Board, module level repair can be a service option also.

4) For CD Mechanism must be ordered with Servo board, the combined part is with code number 996510020151

ELECTRICAL PARTS LIST - KEY BOARD

EN301 996510019674 ENCODER EVEJBBF2020B H20.0
 IC101 996510019609 IC PT6523HQ LQFP-64 PTC
 IC301 996510019583 PHOTO DIODE 638AF4 5V 1.1A
 LED101 996510019820 LED WHITE D3 20mA
 LED102 996510019820 LED WHITE D3 20mA

LED103 996510019820 LED WHITE D3 20mA
 LED104 996510019820 LED WHITE D3 20mA
 LED105 996510019820 LED WHITE D3 20mA
 LED106 996510019820 LED WHITE D3 20mA
 LED301 996510019610 LED B/R

LED302 996510019610 LED B/R
 LED303 996510019610 LED B/R
 LED304C 996510019822 LED GREEN 19-217/GHC-YRSM/3T
 LED304R 996510019822 LED GREEN 19-217/GHC-YRSM/3T
 LED305 996510019610 LED B/R

LED306C 996510019823 LED RED FC-1608SEK-624C
 LED306R 996510019823 LED RED FC-1608SEK-624C
 LED307 996510019610 LED B/R
 LED308 996510019610 LED B/R
 LED309 996510019610 LED B/R

LED310 996510019610 LED B/R
 LED311 996510019610 LED B/R
 LED312 996510019610 LED B/R
 LED313 996510019610 LED B/R
 LED314 996510019610 LED B/R

LED315 996510019610 LED B/R
 LED316 996510019610 LED B/R
 LED317 996510019610 LED B/R
 LED318 996510019821 LED BLUE SBS-0604BC-T3
 Q301 996510019571 TRANSISTOR 2N3904(NPN)

Q302 996510019571 TRANSISTOR 2N3904(NPN)
 Q303 996510019569 TRANSISTOR KTC8550
 Q304 996510019569 TRANSISTOR KTC8550
 SW301 996510019697 TACT SW WT1101EW1-43F-02
 SW302 996510019697 TACT SW WT1101EW1-43F-02


SW303 996510019697 TACT SW WT1101EW1-43F-02
 SW304 996510019697 TACT SW WT1101EW1-43F-02
 SW305 996510019697 TACT SW WT1101EW1-43F-02
 SW306 996510019697 TACT SW WT1101EW1-43F-02
 SW307 996510019697 TACT SW WT1101EW1-43F-02

SW308 996510019697 TACT SW WT1101EW1-43F-02
 SW309 996510019697 TACT SW WT1101EW1-43F-02
 SW310 996510019697 TACT SW WT1101EW1-43F-02
 SW311 996510019697 TACT SW WT1101EW1-43F-02
 SW312 996510019697 TACT SW WT1101EW1-43F-02

SW313 996510019697 TACT SW WT1101EW1-43F-02
 SW314 996510019697 TACT SW WT1101EW1-43F-02
 SW315 996510019697 TACT SW WT1101EW1-43F-02
 SW316 996510019697 TACT SW WT1101EW1-43F-02

ELECTRICAL PARTS LIST - MAIN BOARD

BT101 996510019793 MODULE BLUETOOTH
 C209 996510019788 CAP 0.047F 5.5V
 C901 996510019789 E.CAP 3300uF 20%
 CON406 996510019794 FFC SOCKET 25P 1.0mm
 CON601 996510019790 SOCKET 14P 2.0mm

CON801 996510019560 SOCKET 16P 3.5mm DIP 90
 D101 996510019561 LIGHTNING DIODE YP-701M 700V
 FUS  996510019549 FUSE ATC-5 15A 32V
 IC901 996510019658 IC KIA78D09 TO-252
 IC902 996510019792 IC L7806CV TO-220 ST

L101 996510019795 INDUCTOR 10uH
 L201 996510019795 INDUCTOR 10uH
 L401 996510019795 INDUCTOR 10uH
 L901 996510019555 CHOKE 200uH 1A 30%
 Q101 996510019572 MOSFET AO3401

Q201 996510019569 TRANSISTOR KTC8550
 Q202 996510019566 TRANSISTOR KRC102(NPN)
 Q203 996510019572 MOSFET AO3401
 Q204 996510019566 TRANSISTOR KRC102(NPN)
 Q401 996510019566 TRANSISTOR KRC102(NPN)

Q403 996510019556 TRANSISTOR BD435 TO-126C
 Q404 996510019570 TRANSISTOR MMBT3906LT1(PNP)
 Q405 996510019566 TRANSISTOR KRC102(NPN)
 Q406 996510019571 TRANSISTOR 2N3904(NPN)
 Q407 996510019671 TR KRA102S(PNP) SOT-23

Q408 996510019570 TRANSISTOR MMBT3906LT1(PNP)
 Q409 996510019571 TRANSISTOR 2N3904(NPN)
 Q410 996510019570 TRANSISTOR MMBT3906LT1(PNP)
 Q411 996510019566 TRANSISTOR KRC102(NPN)
 Q412 996510019566 TRANSISTOR KRC102(NPN)

Q413 996510019572 MOSFET AO3401
 Q414 996510019566 TRANSISTOR KRC102(NPN)
 Q421 996510019566 TRANSISTOR KRC102(NPN)
 Q422 996510019570 TRANSISTOR MMBT3906LT1(PNP)
 Q423 996510019566 TRANSISTOR KRC102(NPN)

ELECTRICAL PARTS LIST - MAIN BOARD

Q425	996510019571	TRANSISTOR 2N3904(NPN)
Q426	996510019791	TR S8050(NPN) TO-92
Q501	996510019571	TRANSISTOR 2N3904(NPN)
Q601	996510019567	TRANSISTOR KRC231S(NPN)
Q602	996510019567	TRANSISTOR KRC231S(NPN)
Q603	996510019567	TRANSISTOR KRC231S(NPN)
Q604	996510019567	TRANSISTOR KRC231S(NPN)
Q701	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q703	996510019567	TRANSISTOR KRC231S(NPN)
Q805	996510019571	TRANSISTOR 2N3904(NPN)
Q901	996510019572	MOSFET AO3401
Q902	996510019566	TRANSISTOR KRC102(NPN)
Q904	996510019569	TRANSISTOR KTC8550
Q905	996510019571	TRANSISTOR 2N3904(NPN)
Q906	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q907	996510019569	TRANSISTOR KTC8550
Q908	996510019566	TRANSISTOR KRC102(NPN)
Q980	996510019566	TRANSISTOR KRC102(NPN)
Q981	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q982	996510019566	TRANSISTOR KRC102(NPN)
Q983	996510019572	MOSFET AO3401
R157	996510019551	THERMAL RES GBX050 PTC
TUN101	996510019562	TUNER FM/AM/LW/OIRT
TVS901	996510019577	TVS DIODE SMCJ33CA 1500W
U401	996510029623	IC UPD78F0547 LQFP /55/78
U402	996510019553	IC KIA7027 TO-92 KEC
U403	996510019621	IC AMS1117-3V3 SOT-223 AMS
U501	996510019656	IC TDA7419TR SO28 ST
U601	996510019573	IC NJM4558M SOP8 NJRC
U603	996510019573	IC NJM4558M SOP8 NJRC
U604	996510019573	IC NJM4558M SOP8 NJRC
U801	996510019650	IC E-TDA7386 FLEXIWATT25 ST
U902	996510019557	IC LM2950-5V TO-92 HTC
XT401	996510019563	TCXO 8.000M 20ppm 32pF
XT402	996510019558	TCXO 32.768K 20ppm 12.5pF
Z202	996510019580	ESD DIODE PG05GBUSV 200W 24A
Z203	996510019580	ESD DIODE PG05GBUSV 200W 24A
Z204	996510019580	ESD DIODE PG05GBUSV 200W 24A

ELECTRICAL PARTS LIST - SERVO BOARD

EC6	996510019709	TAN.CAP 10uF 10V 20% A
K	996510019825	FFC 12P 1.00mm 160mm B TYPE
L	996510019826	FFC 25P 1.0mm 120mm TYPE A
LED1	996510019723	INFRARED TRANSMITTER
LED2	996510019723	INFRARED TRANSMITTER
M	996510019827	SCREW PWTS BLUE ZINC M2*4
N	996510019564	V-RES EZJZ1V800AA 3pF DC18V
Q1	996510019571	TRANSISTOR 2N3904(NPN)
Q2	996510019569	TRANSISTOR KTC8550
Q3	996510019571	TRANSISTOR 2N3904(NPN)
Q5	996510019571	TRANSISTOR 2N3904(NPN)
Q6	996510019571	TRANSISTOR 2N3904(NPN)
Q7	996510019571	TRANSISTOR 2N3904(NPN)
SD901	996510019625	12P 2.5MM SD/MMC SOCKET
SWCLOS	996510019722	END-SENSE SW ESE11MH1
U1	996510019622	IC M5673S LQFP-176PIN ALI
U2	996510019717	IC AM5766FM MOTOR DRIVER
U3	996510019621	IC AMS1117-3V3 SOT-223 AMS
U7	996510019828	IC HY57V161610FTP-7
U8	996510019619	IC EN25P20-100GCP 2M-BIT SOP8
XT2	996510019618	TCXO 16.9344M 10ppm 20pF

ELECTRICAL PARTS LIST - FB BOARD

P	996510019823	LED RED FC-1608SEK-624C
SW101	996510019612	TACT SW 2.0mm TS1107GS-3
SW102	996510019727	TACT SW TS-06V-ASM
SW103	996510019725	TACT SW ESE11MV9

ELECTRICAL PARTS LIST - USB BOARD

AUX901	996510019830	SOCKET 3P 6.0mm EARPHONE
USB901	996510019688	USB SOCKET 4P 2.5mm

ELECTRICAL PARTS LIST - SERVO BOARD

D2	996510019617	SCHTTKY DIODE RB551 0.5A 20V
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Note: 1) Only these parts mentioned in the list are normal service parts.

MECHANICAL & ACCESSORIES PARTS LIST (only for CEM250/98)

Loc.	12NC	Description
MAIN UNIT		
4	996510020872	1 BUTTON
5	996510020879	3 BUTTON
6	996510019781	LIGHT GUIDE
9	996510019642	CM700 GEAR
11	996510019641	CMU706 DAMPER
14	996510019782	EJECT BUTTON
17	996510019643	CMB752 SPRING 2 D0.4
18	996510019639	CMB752 LOCKER
21	996510027661	CMB752 SPRING 1 D0.6
22	996510019638	CMB752 HANDSPIKE
25	996510027877	MAIN BOARD MI ASSM
40	996510027855	SERVO BOARD MI ASSM&CDM
47	996510019808	KNOB ENCODER
48	996510020863	DECORAT DOWN
49	996510020869	DECORAT UP
50	996510019815	USB COVER
53	996510027861	OPEN BUTTON
65	996510024811	REAR PANEL
66	996510027843	KEY BOARD
69	996510020876	RETURN BUTTON
71	996510020868	SOURCE BUTTON
73	996510025021	LI-GUIDE
74	996510027848	FRONT PANEL
75	996510020866	DIAL UP BUTTON
76	996510024807	DIAL DOWN BUTTON
77	996510020881	DBB AS BUTTON
78	996510020873	LENS BLK PHILIPS
79	996510019809	RING
A	996510019825	FFC 12P 1.00mm 160mm B TYPE
B	996510019826	FFC 25P 1.0mm 120mm TYPE A
C	996510019729	FFC 6P 1.0mm 35mm TYPE A
D	996510019785	FFC 24P 1.0mm 32mm TYPE C
F	996510027694	I/O CMB752 16P ACC/ILL IN/SPK
MIC	996510020244	EXTERNAL MICROPHONE 3M
SWCL	996510019722	END-SENSE SW ESE11MH1

ELECTRICAL PARTS LIST (only for CEM250/98)

AUX901	996510019830	SOCKET 3P 6.0mm EARPHONE
BT101	996510019793	MODULE BLUETOOTH
C209	996510027872	CAP
C211	996510019874	TAN.CAP 2.2uF 10V A
C211	996510019874	TAN.CAP 2.2uF 10V A
C901	996510019789	E.CAP 3300uF 20%
CN100	996510027858	SOCKET 3P 1.25mm
CN101	996510027869	SOCKET 6P
CN102	996510027856	SOCKET 2P
CON101	996510027852	CONNECTOR 24P
CON202	996510027854	F SOCKET 24P
CON402	996510027844	CONNETOR 16P
CON403	996510027845	F SOCKET 6P
CON406	996510020864	FFC SOCKET 25P 1.0mm

Loc.	12NC	Description
ELECTRICAL PARTS LIST (only for CEM250/98)		

CON601	996520035475	SOCKET 14P 2.0mm
CON801	996520035474	SOCKET 16P 3.5mm
CON903	996510027867	F SOCKET 6P
CON904	996510027853	F SOCKET 24P
CON905	996510025585	SOCKET 24P 2.0mm
D101	996510019561	LIGHTNING DIODE YP-701M 700V
D101	996510019561	LIGHTNING DIODE YP-701M 700V
D101	996510019823	LED RED FC-1608SEK-624C
D102	996510019823	LED RED FC-1608SEK-624C
D2	996510019617	SCHTTKY DIODE RB551 0.5A 20V
D418	996510027875	REC DIODE
D901	996510027865	REC DIODE
EC6	996510019709	TAN.CAP 10uF 10V 20% A
EN301	996510019674	ENCODER EVEJBBF2020B H20.0
FUS	996510019549	FUSE ATC-5 15A 32V
IC101	996510019609	IC PT6523HQ LQFP-64 PTC
IC301	996510019583	PHOTO DIODE 638AF4 5V 1.1A
IC901	996510020507	IC L7809CV TO-220 ST
IC902	996510019574	IC L78M06CDT-TR TO-252 ST
J1	996510027849	F SOCKET 16P
J2	996510027846	FFC SOCKET 12P
J3	996510019794	FFC SOCKET 25P 1.0mm
L101	996510019795	INDUCTOR 10uH
L201	996510019795	INDUCTOR 10uH
L401	996510019795	INDUCTOR 10uH
L901	996510019555	CHOKE 200uH 1A 30%
LCD301	996510019840	LCD ETN
LED102	996510019820	LED WHITE D3 20mA
LED103	996510019820	LED WHITE D3 20mA
LED105	996510019820	LED WHITE D3 20mA
LED106	996510019820	LED WHITE D3 20mA
LED301G	996510019821	LED BLUE SBS-0604BC-T3
LED301R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED302G	996510019821	LED BLUE SBS-0604BC-T3
LED302R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED303G	996510019821	LED BLUE SBS-0604BC-T3
LED303R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED304G	996510019822	LED GREEN 19-217/GHC-YRSM/3T
LED304R	996510019822	LED GREEN 19-217/GHC-YRSM/3T
LED305G	996510019821	LED BLUE SBS-0604BC-T3
LED305R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED306G	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED306R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED307G	996510019821	LED BLUE SBS-0604BC-T3
LED307R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED308G	996510019821	LED BLUE SBS-0604BC-T3
LED308R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED309G	996510019821	LED BLUE SBS-0604BC-T3
LED309R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED310G	996510019821	LED BLUE SBS-0604BC-T3
LED310R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED311G	996510019821	LED BLUE SBS-0604BC-T3
LED311R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED313G	996510019821	LED BLUE SBS-0604BC-T3
LED313R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED314G	996510019821	LED BLUE SBS-0604BC-T3
LED314R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED315G	996510019821	LED BLUE SBS-0604BC-T3

Loc.	12NC	Description
LED315R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED316G	996510019821	LED BLUE SBS-0604BC-T3
LED316R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
LED317G	996510019821	LED BLUE SBS-0604BC-T3
LED317R	996510027684	LED R 19-22/R6BHC-C03/2T-YUG
Q1	996510019571	TRANSISTOR 2N3904(NPN)
Q1	996510019568	TRANSISTOR S8050(NPN)
Q101	996510019572	MOSFET AO3401
Q2	996510019569	TRANSISTOR KTC8550
Q2	996510027868	TR S9014LT1(NPN)
Q201	996510019569	TRANSISTOR KTC8550
Q201	996510019569	TRANSISTOR KTC8550
Q202	996510019566	TRANSISTOR KRC102(NPN)
Q203	996510019572	MOSFET AO3401
Q204	996510019566	TRANSISTOR KRC102(NPN)
Q3	996510019571	TRANSISTOR 2N3904(NPN)
Q301	996510019571	TRANSISTOR 2N3904(NPN)
Q302	996510019571	TRANSISTOR 2N3904(NPN)
Q303	996510019569	TRANSISTOR KTC8550
Q304	996510019569	TRANSISTOR KTC8550
Q401	996510019566	TRANSISTOR KRC102(NPN)
Q403	996510019556	TRANSISTOR BD435 TO-126C
Q404	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q404	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q405	996510019566	TRANSISTOR KRC102(NPN)
Q406	996510019571	TRANSISTOR 2N3904(NPN)
Q406	996510019571	TRANSISTOR 2N3904(NPN)
Q407	996510019671	TR KRA102S(PNP) SOT-23
Q408	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q409	996510019571	TRANSISTOR 2N3904(NPN)
Q410	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q411	996510019566	TRANSISTOR KRC102(NPN)
Q412	996510019566	TRANSISTOR KRC102(NPN)
Q413	996510019572	MOSFET AO3401
Q414	996510019566	TRANSISTOR KRC102(NPN)
Q421	996510019566	TRANSISTOR KRC102(NPN)
Q422	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q423	996510019566	TRANSISTOR KRC102(NPN)
Q425	996510019571	TRANSISTOR 2N3904(NPN)
Q426	996510027851	TR KTC805
Q426	996510019791	TR S8050(NPN) TO-92
Q5	996510019571	TRANSISTOR 2N3904(NPN)
Q501	996510019571	TRANSISTOR 2N3904(NPN)
Q6	996510019571	TRANSISTOR 2N3904(NPN)
Q601	996510019567	TRANSISTOR KRC231S(NPN)
Q602	996510019567	TRANSISTOR KRC231S(NPN)
Q602	996510019567	TRANSISTOR KRC231S(NPN)
Q603	996510019567	TRANSISTOR KRC231S(NPN)
Q604	996510019567	TRANSISTOR KRC231S(NPN)
Q7	996510019571	TRANSISTOR 2N3904(NPN)
Q701	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q703	996510019567	TRANSISTOR KRC231S(NPN)
Q703	996510019567	TRANSISTOR KRC231S(NPN)
Q704	996510019567	TRANSISTOR KRC231S(NPN)
Q8	996510019671	TR KRA102S(PNP) SOT-23
Q805	996510019571	TRANSISTOR 2N3904(NPN)
Q901	996510019572	MOSFET AO3401
Q901	996510019572	MOSFET AO3401

MECHANICAL & ACCESSORIES PARTS LIST (only for CEM250/98)

Loc.	12NC	Description
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ELECTRICAL PARTS LIST (only for CEM250/98)

Q902	996510019566	TRANSISTOR KRC102(NPN)
Q904	996510019569	TRANSISTOR KTC8550
Q904	996510019569	TRANSISTOR KTC8550
Q905	996510019571	TRANSISTOR 2N3904(NPN)
Q906	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q907	996510019569	TRANSISTOR KTC8550
Q908	996510019566	TRANSISTOR KRC102(NPN)
Q909	996510019566	TRANSISTOR KRC102(NPN)
Q980	996510019566	TRANSISTOR KRC102(NPN)
Q981	996510019570	TRANSISTOR MMBT3906LT1(PNP)
Q982	996510019566	TRANSISTOR KRC102(NPN)
Q983	996510019572	MOSFET AO3401
R157	996510019551	THERMAL RES GBX050 PTC
R224	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R230	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R236	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R237	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R433	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R635	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R636	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R718	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R929	996510019564	V-RES EZJZ1V800AA 3pF DC18V
R930	996510019564	V-RES EZJZ1V800AA 3pF DC18V
SD901	996510019625	12P 2.5MM SD/MMC SOCKET
SW301	996510020874	TACT SW 4.3mm 250gf
SW302	996510020874	TACT SW 4.3mm 250gf
SW303	996510020874	TACT SW 4.3mm 250gf
SW304	996510020874	TACT SW 4.3mm 250gf
SW305	996510020874	TACT SW 4.3mm 250gf
SW306	996510020874	TACT SW 4.3mm 250gf
SW307	996510020874	TACT SW 4.3mm 250gf
SW308	996510020874	TACT SW 4.3mm 250gf
SW309	996510020874	TACT SW 4.3mm 250gf
SW310	996510020874	TACT SW 4.3mm 250gf
SW311	996510020874	TACT SW 4.3mm 250gf
SW312	996510020874	TACT SW 4.3mm 250gf
SW313	996510020874	TACT SW 4.3mm 250gf
SW314	996510020874	TACT SW 4.3mm 250gf
SW315	996510020874	TACT SW 4.3mm 250gf
SW316	996510020874	TACT SW 4.3mm 250gf
TUN101	996510025016	TUNER KST-CF111LVD-178F
TVS901	996510019577	TVS DIODE SMCJ33CA 1500W
U1	996510019622	IC M5673S LQFP-176PIN ALI
U1	996510027866	IC SC73P1601
U2	996510019717	IC AM5766FM MOTOR DRIVER
U201	996510019792	IC L7806CV TO-220 ST
U3	996510019621	IC AMS1117-3V3 SOT-223 AMS
U401	996510029657	IC UPD78F0547 /98
U402	996510019553	IC KIA7027 TO-92 KEC
U403	996510019621	IC AMS1117-3V3 SOT-223 AMS
U501	996510019656	IC TDA7419TR SO28 ST
U601	996510019573	IC NJM4558M SOP8 NJRC
U603	996510019573	IC NJM4558M SOP8 NJRC
U604	996510019573	IC NJM4558M SOP8 NJRC
U7	996510019620	IC IS42S16100-7T SOP ISSI
U8	996510019619	IC EN25P20-100GCP 2M-BIT SOP8
U801	996510019650	IC E-TDA7386 FLEXIWATT25 ST
U902	996510019557	IC LM2950-5V TO-92 HTC

Loc.	12NC	Description
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ELECTRICAL PARTS LIST (only for CEM250/98)

USB901	996510027859	SOCKET 4P
X1	996510027874	TCXO 4.000M
XT2	996510019618	TCXO 16.9344M 10ppm 20pF
XT401	996510019563	TCXO 8.000M 20ppm 32pF
XT402	996510019558	TCXO 32.768K 20ppm 12.5pF
Z202	996510027664	ESD DIODE 200W 24A 5G
Z203	996510027664	ESD DIODE 200W 24A 5G
Z204	996510027664	ESD DIODE 200W 24A 5G
ZD101	996510019863	ZENER DIODE 6V8 1/2W 1206
ZD102	996510019863	ZENER DIODE 6V8 1/2W 1206
ZD103	996510019863	ZENER DIODE 6V8 1/2W 1206
ZD104	996510019863	ZENER DIODE 6V8 1/2W 1206
ZD301	996510019862	ZENER DIODE 3.3V 1/2W
ZD401	996510027871	ZENER DIODE
ZD402	996510019863	ZENER DIODE 6V8 1/2W 1206
ZD902	996510019863	ZENER DIODE 6V8 1/2W 1206
ZD904	996510019863	ZENER DIODE 6V8 1/2W 1206
ZR414	996510019564	V-RES EZJZ1V800AA 3pF DC18V
ZR415	996510019564	V-RES EZJZ1V800AA 3pF DC18V
ZR416	996510019564	V-RES EZJZ1V800AA 3pF DC18V
ZR417	996510019564	V-RES EZJZ1V800AA 3pF DC18V
ZR418	996510019564	V-RES EZJZ1V800AA 3pF DC18V
ZR419	996510019564	V-RES EZJZ1V800AA 3pF DC18V
ZR420	996510019564	V-RES EZJZ1V800AA 3pF DC18V

Note: 1) Only these parts mentioned in the list are normal service parts.

2) For Key Board & Main Board & Servo Board, module level repair can be a service option also.

3) For CD Mechanism must be ordered with Servo board, the combined part is with code number **996510027855**

Loc.	12NC	Description
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REVISION LIST

1.0 Manual 3141 785 33190

Initial Service Manual released.

1.1 Manual 3141 785 33191

In this version, the version CEM250X/78 added.

Page 11-2, Mechanical & Accessories Parts List updated.

129 996510020151 SERVO BOARD & CD MECHANISM (WAS 996510019824)

141 996510020150 CE250 MAIN BOARD (WAS 996510019787)

1.2 Manual 3141 785 33192

In this version, the version CEM250/98 added.

Page 11-2B & 11-3B, Mechanical & Accessories Parts List added.

1.3 Manual 3141 785 33193

In this version,

Page 11-3B Electrical Parts List updated.

U401 996510029657 IC UPD78F0547 W/SW /98 (WAS 996510019579)

Page 11-4 Electrical Parts List updated.

U401 996510029623 IC UPD78F0547 W/SW /55/78 (WAS 996510019579)